TECHNOLOGY DEPT.

Gas Journal

Vol. 267. 103rd Year. LONDON, JULY 25. 1951. No. 4599 Price 1/-

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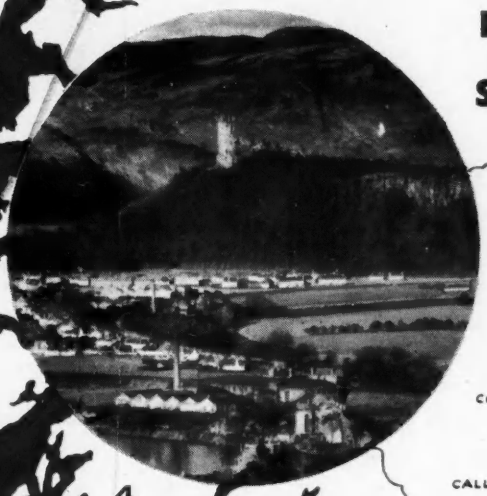

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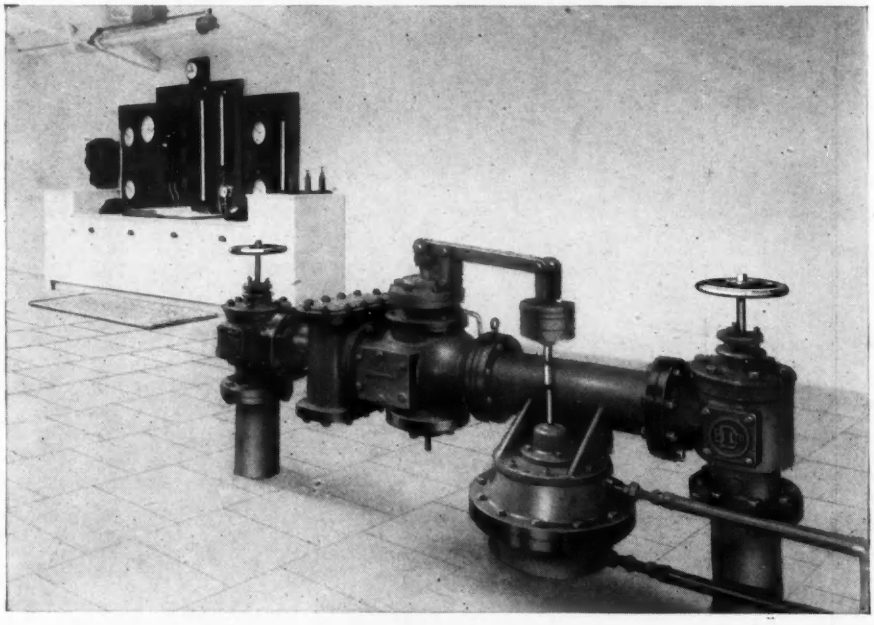
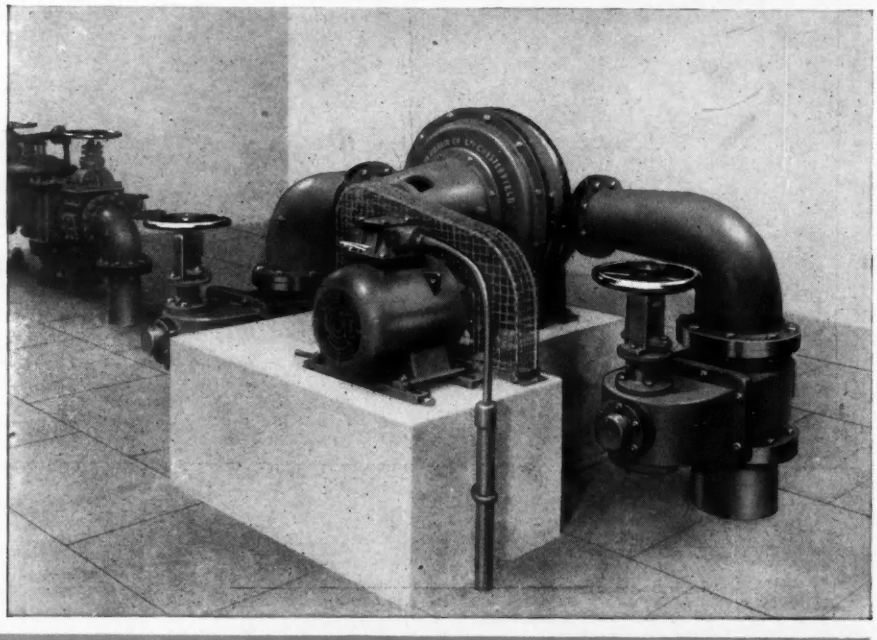
Another Installation of a Completely Automatic Volumetric Governor and Rateau Turbo Booster Plant, at the Totnes Gas Holder Station of the Torquay and District Sub-Division, South Western Gas Board.





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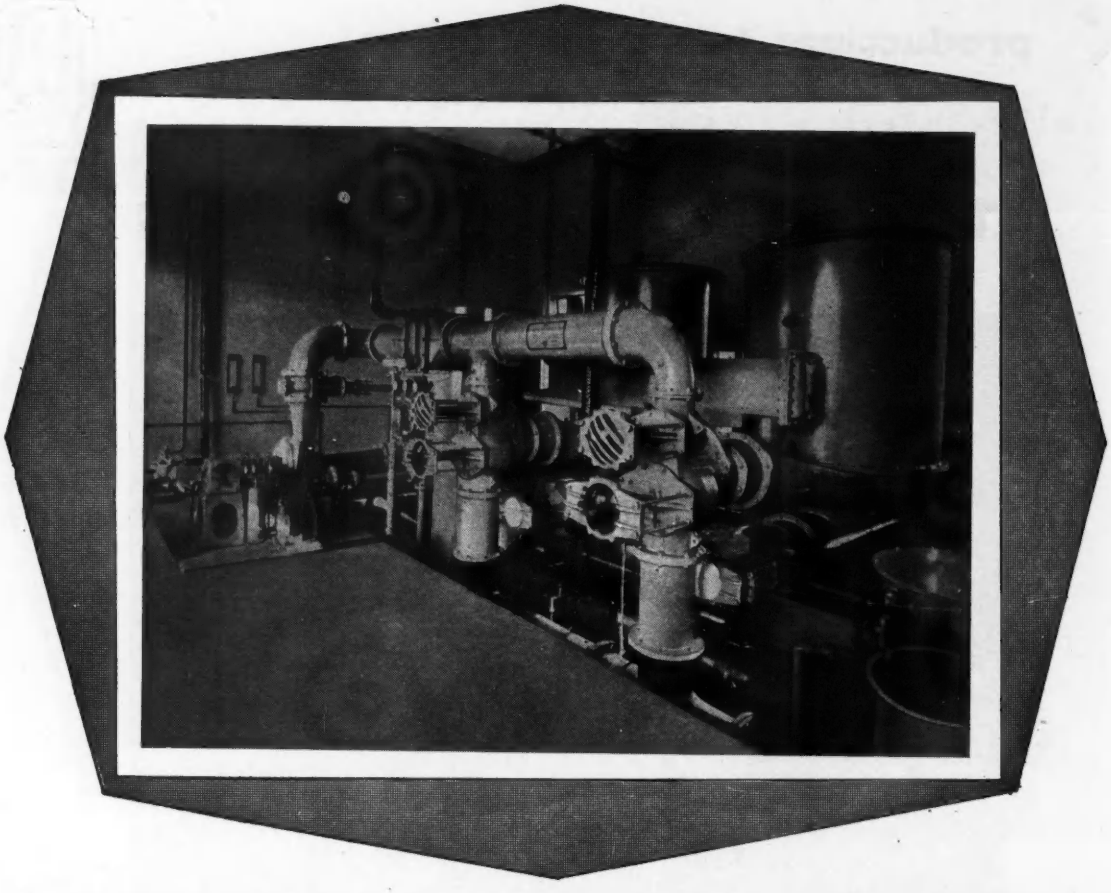

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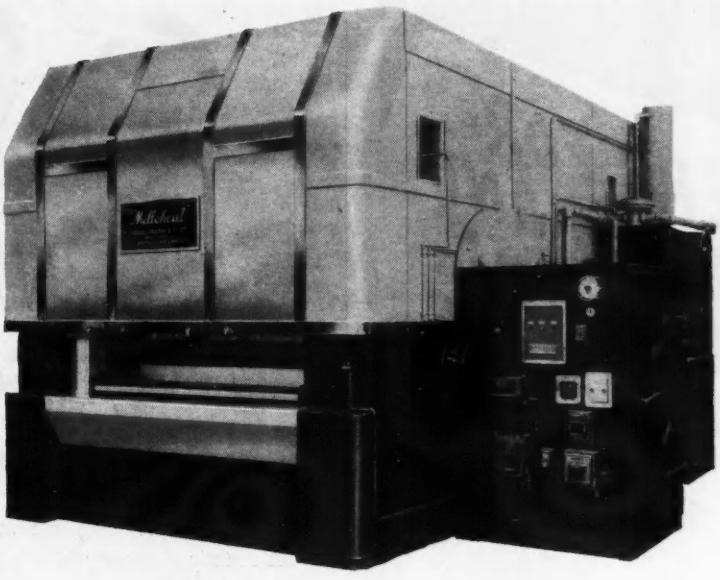

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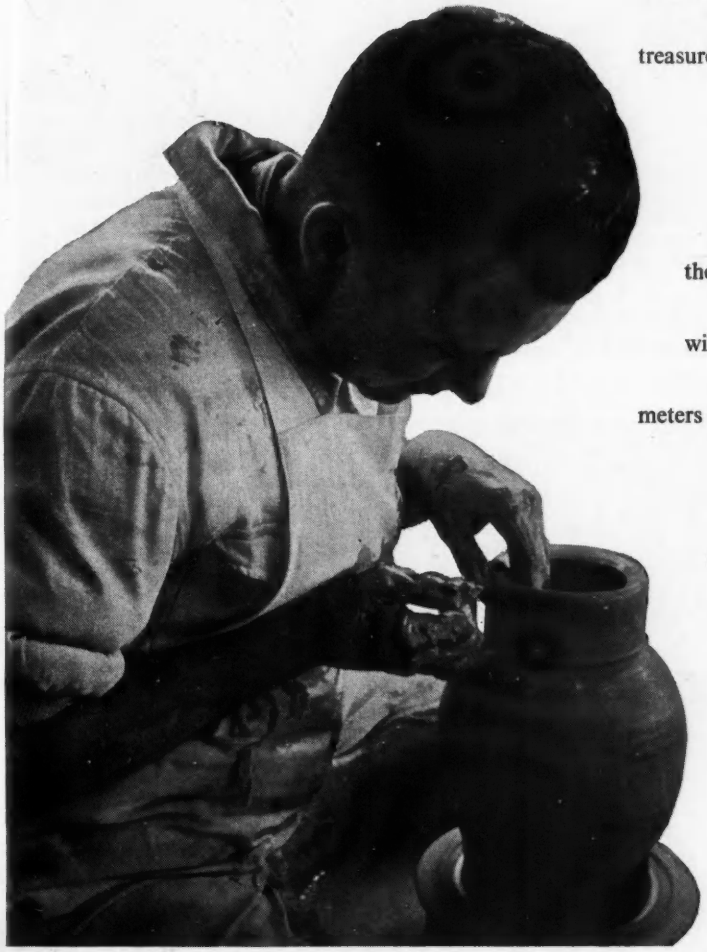
Almost carelessly does the thrower mould the spinning clay. So skilled are his hands that the job looks deceptively easy: any who have accepted the invitation to "try it for themselves" know only too well the extent of the deception.



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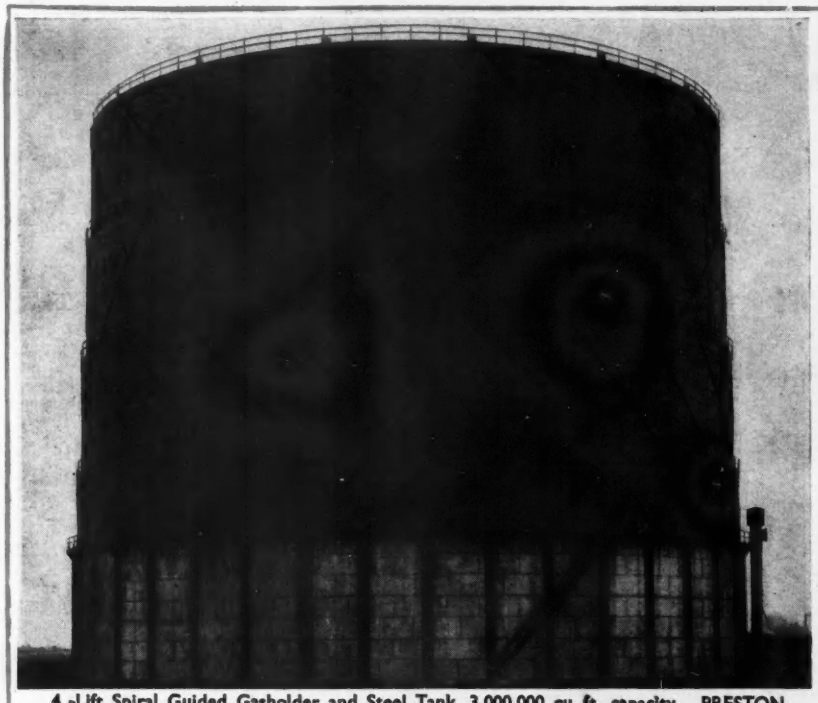

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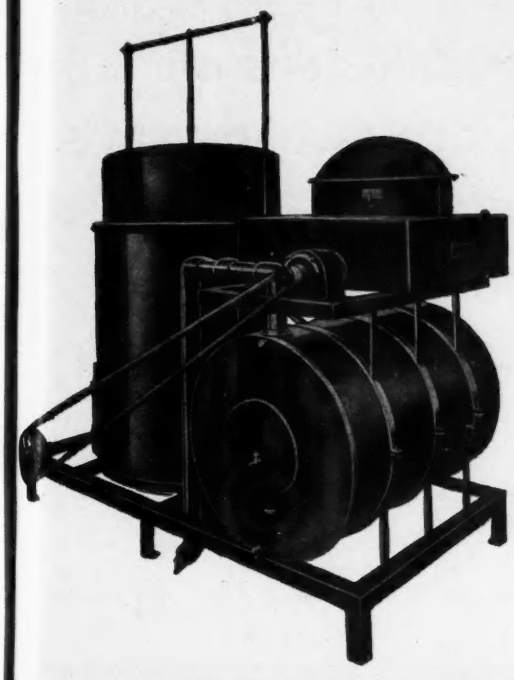

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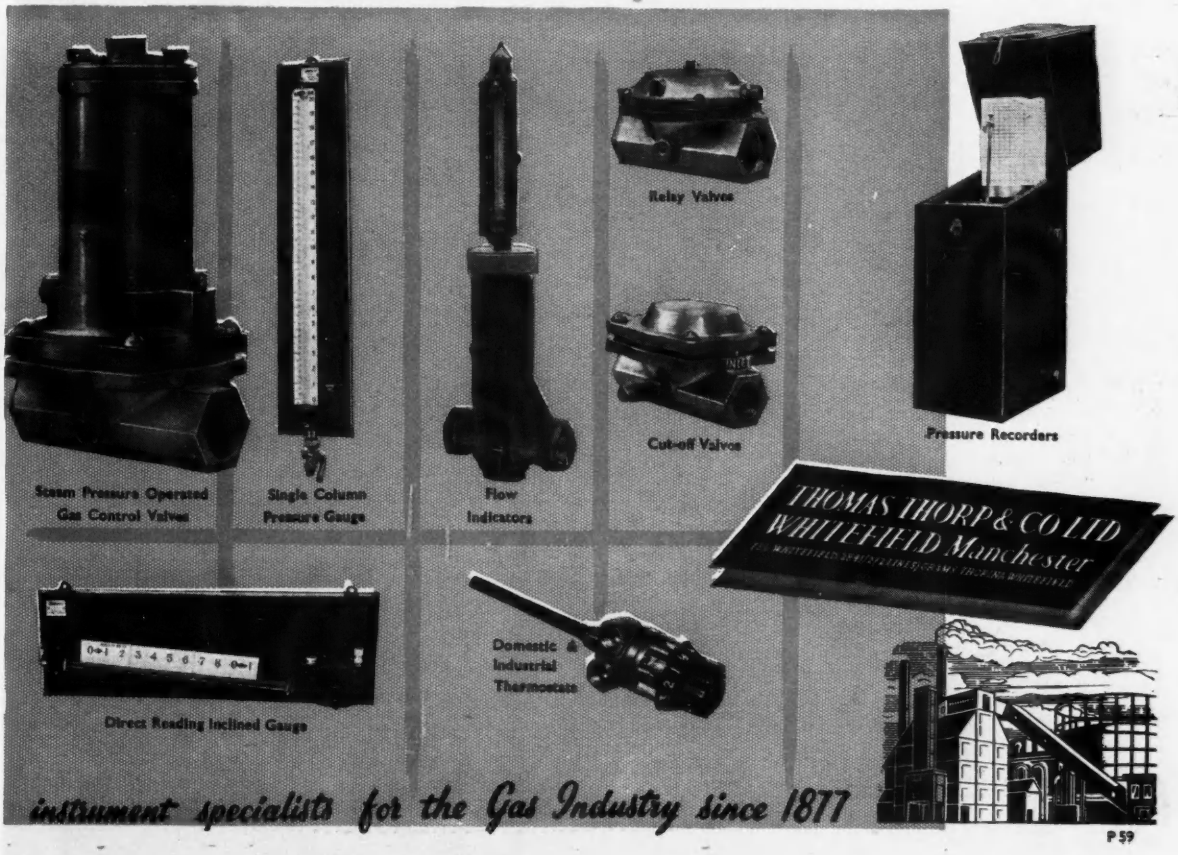
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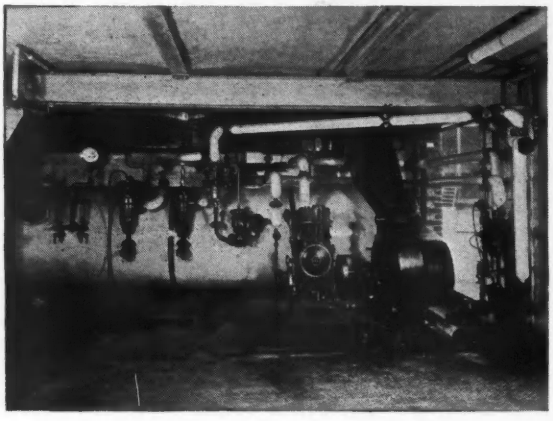

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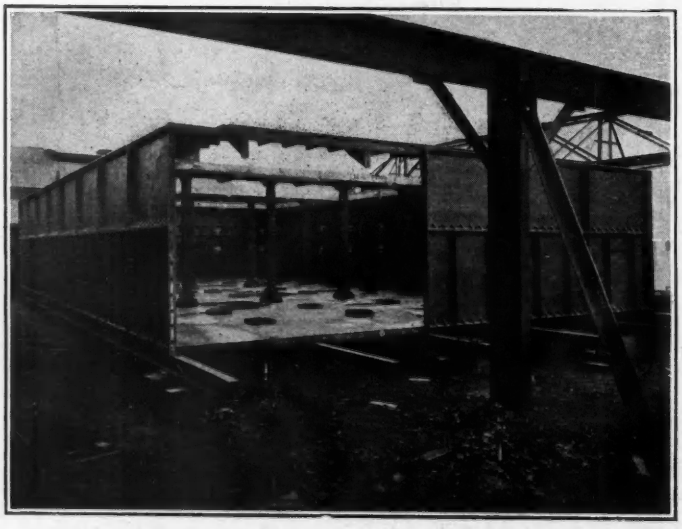

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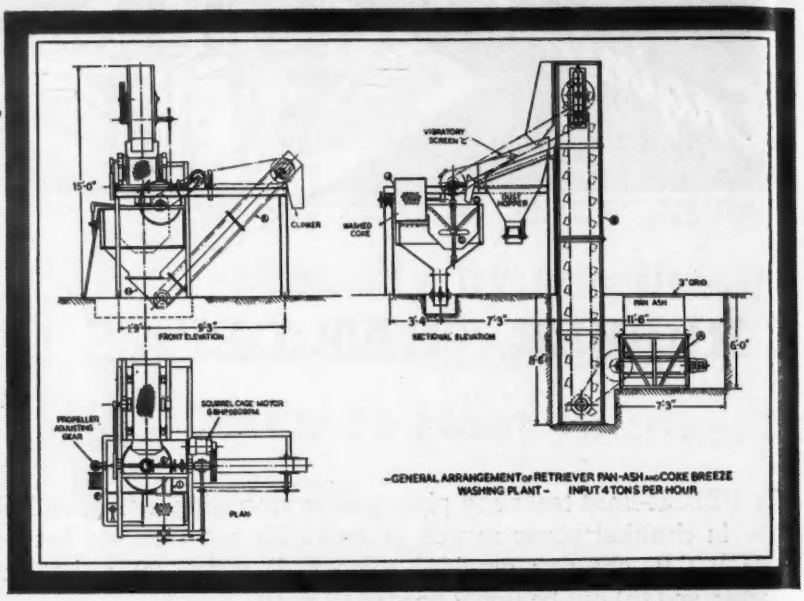

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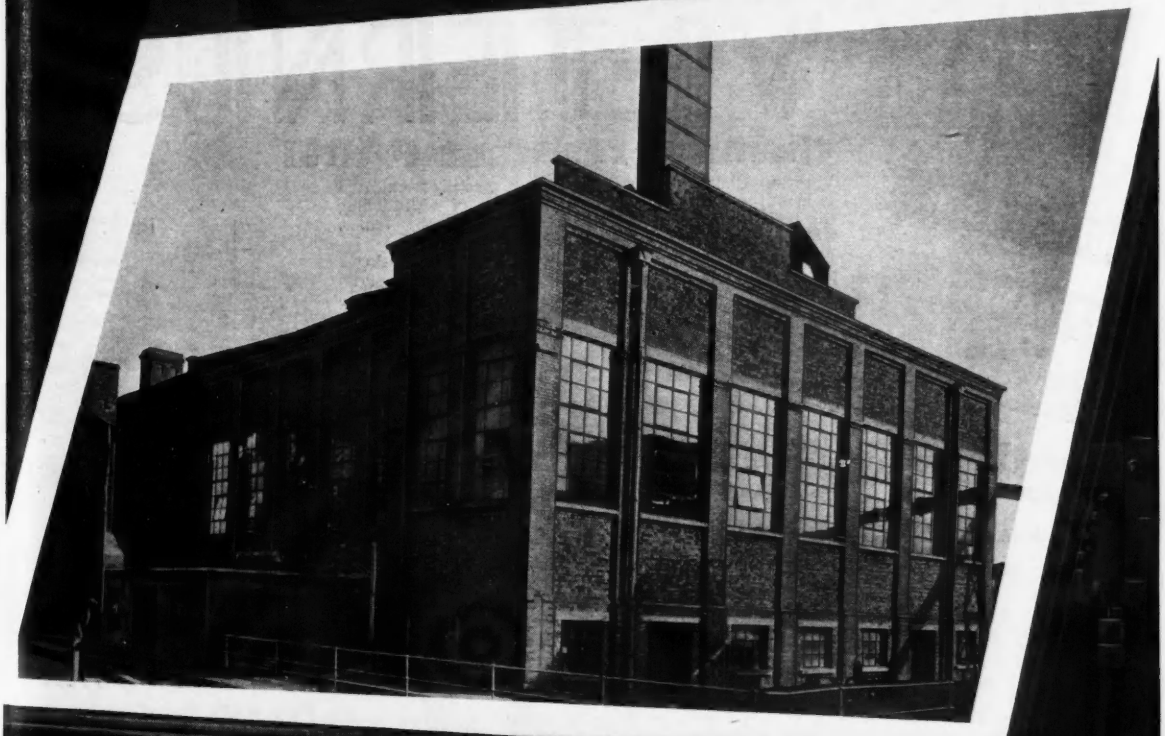

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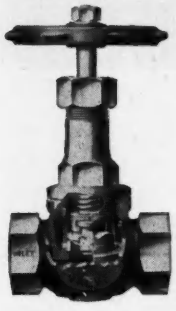

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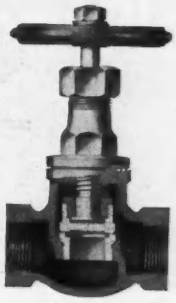

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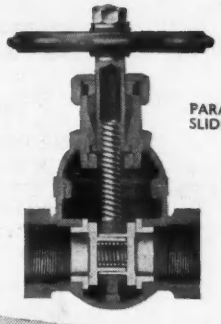

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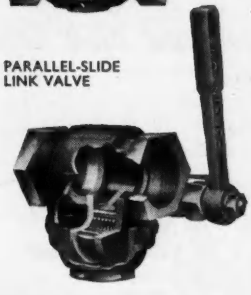

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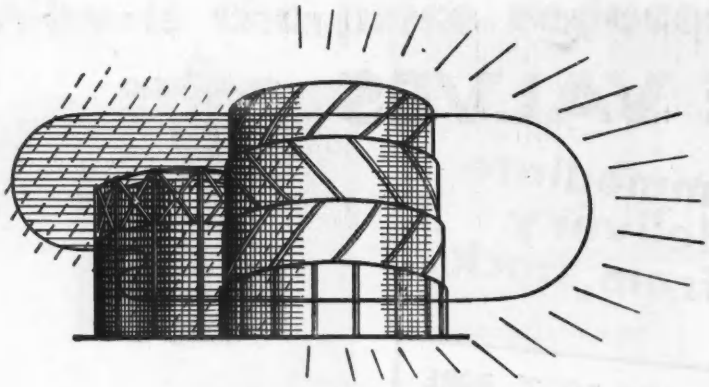

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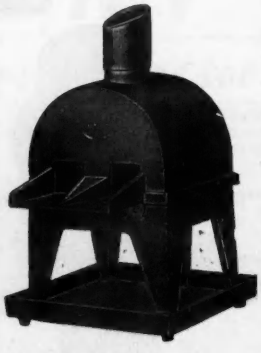

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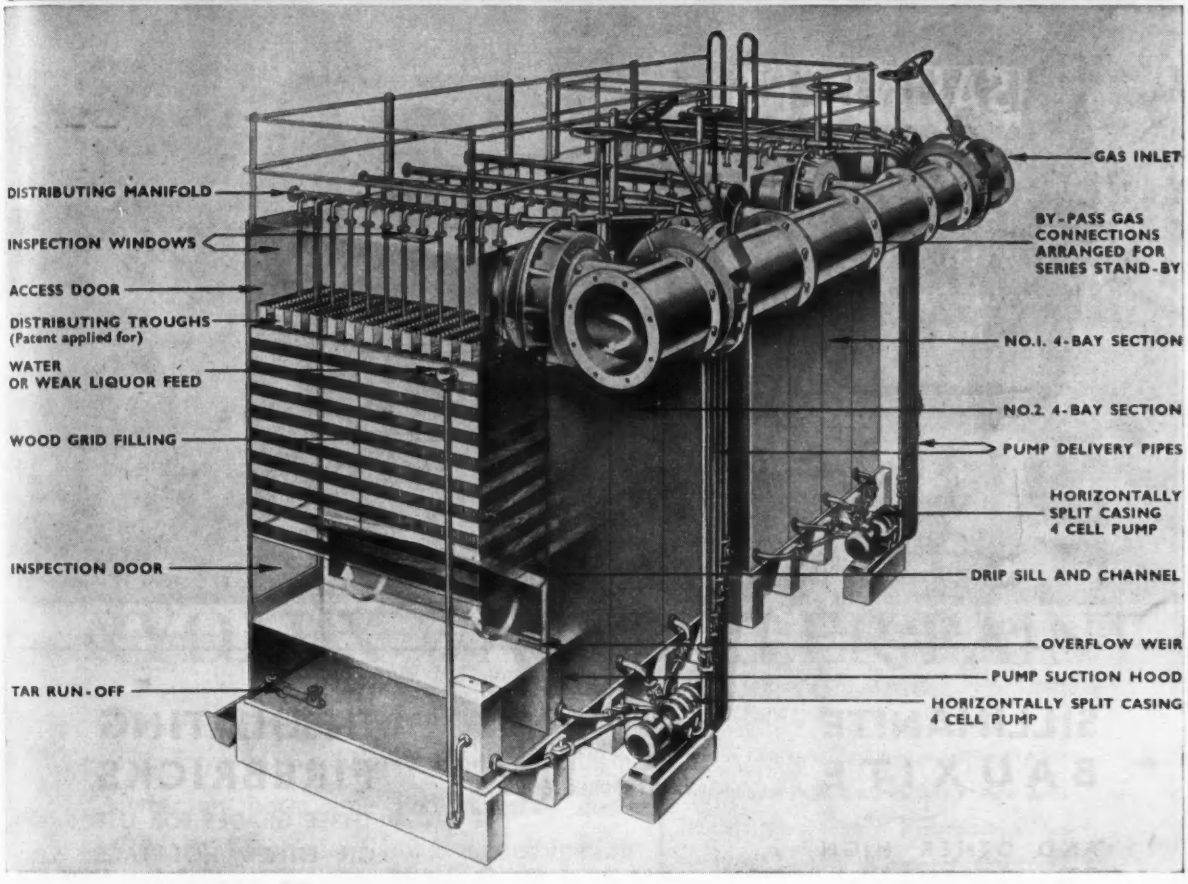

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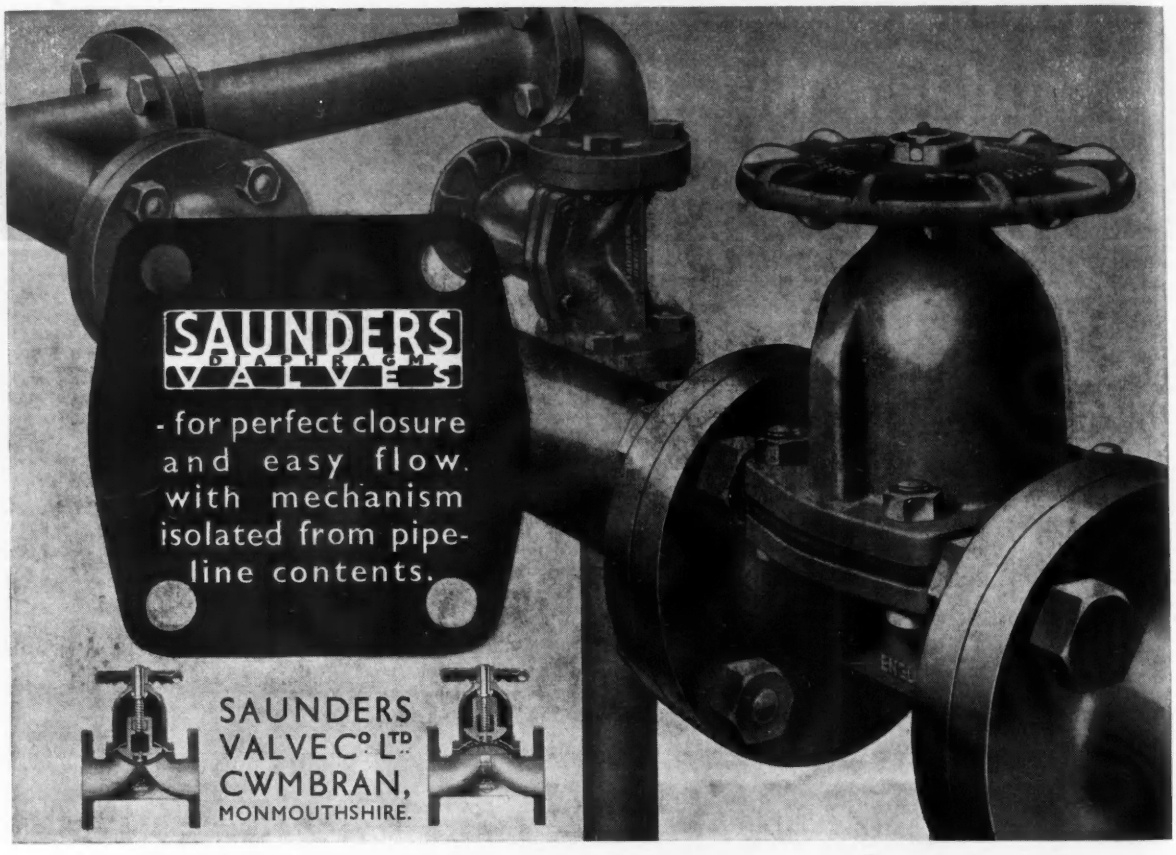
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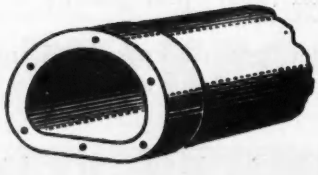

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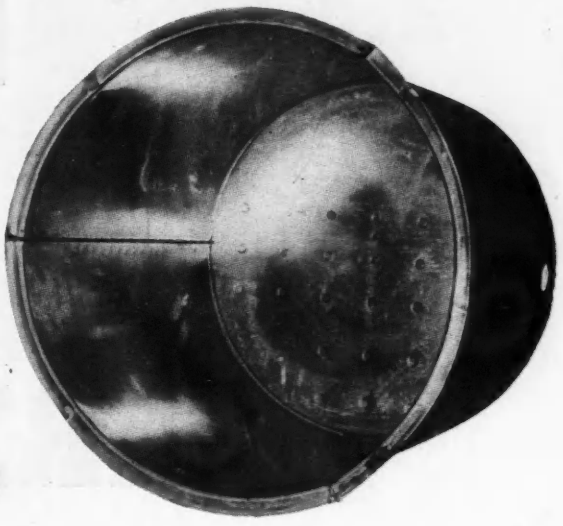

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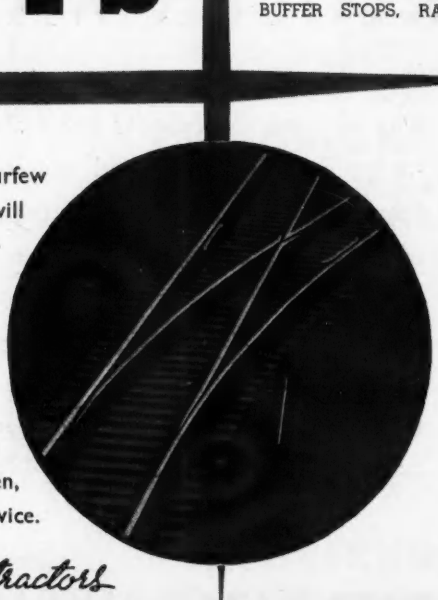

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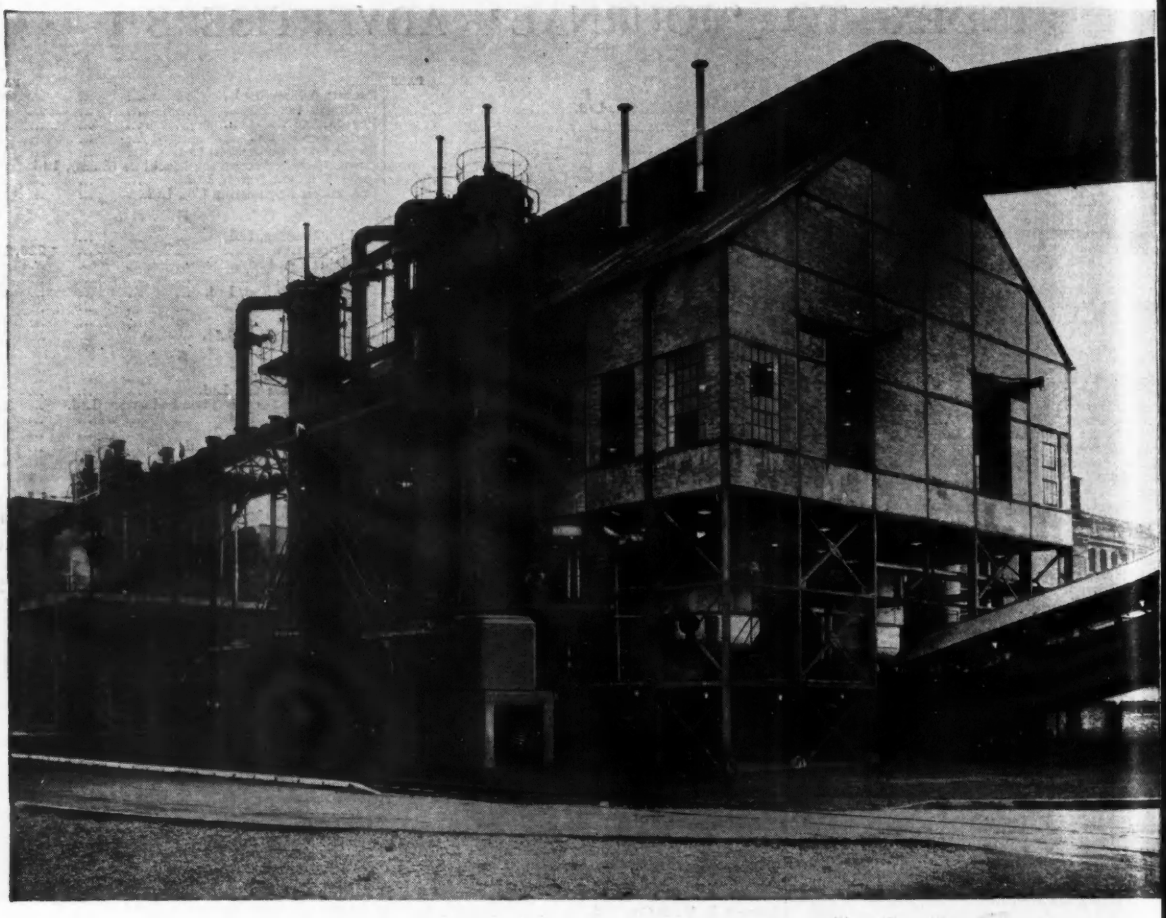

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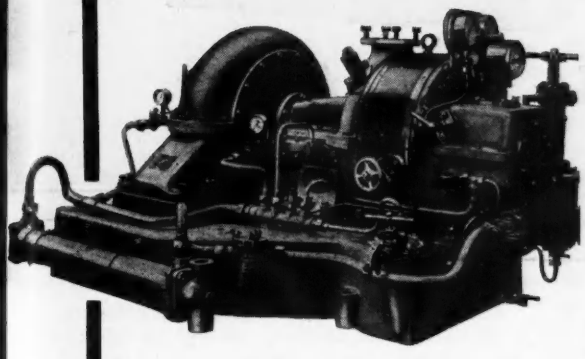

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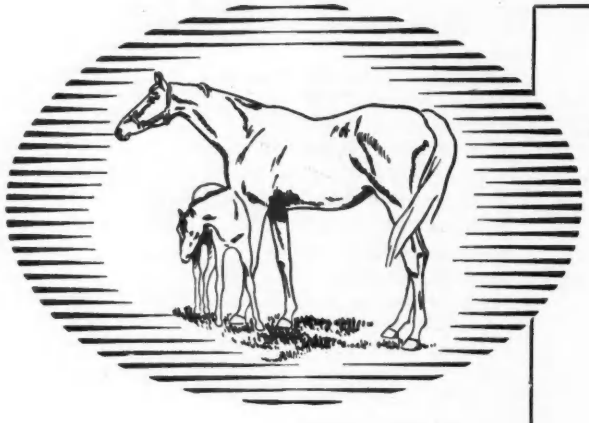

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GAS JOURNAL

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SECOND RESEARCH MOVE

AS announced in our columns last week, the second research step has been made by the Gas Council, the new centre being, as many anticipated, Birmingham, with its fine laboratories at Nechells, and with its Director, Dr. F. J. Dent, young but ripe in experience and knowledge of what the gas industry wants. Dr. Dent has throughout his career concentrated chiefly on complete gasification, and we should say that, as far as this country is concerned, his knowledge in this field of research is unique. The Chairman of the Gas Research Board in its passing-out stages, Colonel H. C. Smith, Deputy Chairman of the Gas Council, stated last week that the immediate plan at Nechells will be to focus all attention on complete gasification, and we know that Dr. Dent will be carrying with him a large number of the staff of the Gas Research Board who have worked with him with conspicuous success at Bournemouth. There can surely be no disagreement with the decision to press forward with full energy and full financial resources this attack on the fuel problem. The demand for gas, the limitations in the supply of coking coal, the ever-increasing prices of coal and oil, the need for exploiting weakly-caking coals, the labour aspect—all call for a forceful approach to the work; and we are sure that the Government as well as the gas industry itself will follow the investigation closely. Dr. Dent has a big task and also a great opportunity. Those who know him are aware of the optimism with which he regards the outcome—redolent, indeed, in the paper which we publish today (p. 230).

The original mind is not the product of the classroom—otherwise there would be few teachers earning their salaries. And research cannot be fruitful by way of the unthinking lash or rod. But those on the job (as every war proves) can do more than a good deal with a good deal of encouragement. We think that this encouragement in regard to complete gasification will without doubt be forthcoming, and though it cannot hasten originality we hope that it will provide a gentle prod to the earnest research worker and stir his consciousness amid laboratory dreams, amid his pipette sonatas. And those who profess to think in other channels, though they may not directly pay the bill, will be asking the question why the Gas Research Board could not have carried on the good work with similar backing. We are not going to enter into this controversy for the simple reason that Rome has fallen and the ruins of Beckenham are, willy nilly, near. As far as the personal factor is concerned—the personal factor of the research worker—we are informed on good authority that the catalytic air of Nechells and its environs compares favourably with that of Poole and Pitwines. As yet we have had no opportunity of proving this. Perhaps the Gas Council and Dr. Dent will duly—and in good time—provide the answer.

THE EFFLUENTS POSITION TODAY

DISCUSSION of the effluent disposal question had become untidy. Dr. Arthur Marsden, in a paper to the South Western Section of the Institution of Gas Engineers, has rendered a great service to the industry by setting out in so orderly and complete a fashion the elements of the problem and the present situation in the campaign to solve it. He pays well-deserved tribute to the still outstanding value of Dr. Key's admirable little book on the subject. Indeed this paper may be regarded as a revised version, necessarily a little shorter but sufficiently long to carry all significant work which has been done since. The situa-

tion continues to be fluid but 'the law will provide the incentive, if nothing else does,' to arrive at some definite conclusions.

Efforts in this direction have been deplorably fixed on disposal rather than utlilisation. Disposal in this connection is defined by Dr. Marsden as getting rid of the various liquids without infringement of the law, without causing nuisance or damage to other people's property, with the minimum of expense or, if possible at a profit. The case of sulphate manufacture is a tragic example of the way in which the operations of finance may result in the waste of a national asset. Are we not witnessing something like it in the present desperate situation in sulphur and sulphuric acid supply? The fact that, whereas sulphate 30 years ago was contributing substantially to the cost of gas-making, by 1932 it had changed to the other side of the balance-sheet, is by now an old and tiresome story. It is at any rate refreshing to find that Dr. Marsden declines to resign himself to pessimism. Conditions are changing and this problem will have to be continually reconsidered in terms of national conservation as well as those of mere disposal. Apart from ammoniacal liquor as effluent, which dominates the situation, Dr. Marsden lists a number of other effluents demanding consideration and treatment and he gives a valuable and eminently practical summary of precautions to be taken in their disposal, measures, mainly, necessary to prevent oil, solids, and noxious gases from being entrained with them into drains and sewers. The special case of ammoniacal liquor is treated at adequate and considerable length. It is Key up to date. Much has been written recently on this subject. It is good to have it all brought together in one statement. Some of the new points appear to be those relating to the Manchester process and the properties and effects of the new type of effluent from liquid purification systems. Disposal by way of the sewage works claims a large section of the paper. A change, not for the better, is noted in the attitude of local authorities (owners of the sewage works) towards the gas undertakings which are not now under their ownership. To say the least, there is not now the same identity of interest.

Questions of the standard tests for assessing the degree of pollution resulting from increased oxygen demand are discussed again at length. Toxic substances discharged into water courses may not only be directly lethal to fish and other forms of life; they may reduce the amount of oxygen in the water to such a point that some living organisms cannot survive. A subtle consequence of this may be the disturbance of the balance of flora and fauna necessary to healthy conditions. The need for further and continued collaboration between gasworks and sewage purification technicians and scientists is shown by the fact that the standard for purified sewage has never yet been legalised although the recommendations of the Royal Commission still stand where they were when Dr. Key was writing. No doubt the difficulty is enhanced by the presence of industrial effluents other than those issuing from the gasworks. Of other methods of disposal the most interesting, and those which should be pushed most urgently, are aimed at making use of the ammonia. It was good to note that Dr. Marsden devoted quite a lot of space to its use as a fertiliser. Developments in this direction are complicated by a number of factors of which the seasonal nature of some of the requirements is not the least. Uses of two main kinds seem to be perfectly practicable. The liquor has been fed straight to the soil (at appropriate seasons only), and it can be used at any time (though more successfully in the summer) to break down straw and other waste vegetable matter into humus thus enriched with nitrogen.

ECONOMIC ASPECTS

On the economic aspects Dr. Marsden repeats his dictum of June, 1950, a dictum which will be accepted in all sides, 'that the disposal' (in the sense of 'getting rid') 'of untreated crude ammoniacal liquor from large carbonising units is wrong from the national point of view.' The economics of sulphate manufacture has already been referred to. The production of concentrated liquor is not fundamentally different. There is a ray of hope in dephenolation which, though it does not in itself recover ammonia, improves the effluent in certain respects. In the interesting Partington plant it was associated with sulphate manufacture by the semi-direct process. It would be interesting to know definitely whether this combination is still showing a profit. An account of its life history might be a good subject for a paper to a District Section of the Institution. The plant at Tingley, briefly described, is of great interest—if only because the disproportion which there exists between the volume of effluent produced and the normal flow to the local sewage works is likely to be repeated in the several large concentrations of gas-making plant which are now in construction or contemplated. Where liquors must be discharged to the sewers there is the question of the charges to be made for their treatment, and the discovery of an equitable rate. In any case it should be remembered that the costs involved become a charge upon the public either in the form of an increase in gas price or in cost of sewage purification.

Dr. Marsden's essay is essentially a summary of the work of many investigations. He claims to present no fundamentally new information, but his valuable comments will be read with close attention. The essay is intensely realistic. It holds out no great hopes of solutions likely to be immediately satisfactory. But its attitude to the question is expressed in the word 'dynamic,' more than once used in such phrases as 'a dynamic outlook in regard to effluent disposal.' A formidable weight of scientific and technical ability has been and still is brought to bear upon it. The new Gasworks Effluents Committee has a task of the very greatest difficulty, complexity, and importance laid upon it. It must be assured not only of the co-operation of sewage purification authorities and specialists but of the ungrudging support of its own industry. It is to be hoped that its labours will result rather in the utilisation of ammonia than in getting rid of it.

BRITISH INSTRUMENTS

THIS country has long led the field in scientific instrument design, and today, perhaps more than ever before, the perfection of our controlling, regulating, and recording instruments has become a matter of vital necessity not only with a view to selling our industrial plant in the world markets, but in conserving our own fuel supplies. For it is almost trite to say that no matter how skilled the operator of a plant, it is the accuracy of the instruments which finally decides production costs. For this reason no effort on the part of instrument makers which has as its goal higher production efficiency is wasted. While we have had for many years exhibitions devoted to certain specific branches of instrumentation, it was not until this month that we witnessed an exhibition devoted exclusively to the British instrument industry as a whole. At this exhibition, which is referred to in greater detail on later pages of this issue, there was a wide range of highly scientific equipment displayed by over 150 leading manufacturers and applicable to practically every phase of industry. We are not going to pretend that we understood all we saw at this comprehensive exhibition, although much of it had direct application to our own industry; but after walking round and talking with many of the exhibitors we came away with the certainty that we had seen expressed in the many and varied exhibits the ability of British instrument makers to provide a complete service of instrumentation and automatic recording and control for every major industry. It was, indeed, a vivid demonstration to the world of British pre-eminence in a field linked closely with maximum production efficiency.

TRANSPORT DEFICIT

SECOND industry to be nationalised in the post-war era, the British Transport Commission which in 1947 took over rail and road services, docks, inland waterways, and hotels, ended 1950 with a deficit of £14.1 mill. for the year. There was a working surplus of £40 mill. towards meeting central charges of £54 mill. Like the gas industry, transport is expected to make financial ends meet 'taking one year with another,' and the only way to do that is to raise its charges more or less in step with its increased costs. The deficit in 1949 was £20.8 mill., and in 1948 £4.7 mill., making a total of £39.6 mill. for the three years, and it is estimated that for 1951 the loss can scarcely be less than in 1950. Regarding the future, the Commission in its annual report asks for adequate resources and a more adequate allocation of the total amount available for national capital investment; greater willingness to accept changes, whether in conditions of work, types of service, or proposals to integrate services, and avoidance of costly delaying action on each proposal for re-organisation; a scheme of public control over the general levels of fares and charges which is both speedy and flexible in operation; and new bases and charges for transport services which will recognise that over a wide field the Commission's services are not a monopoly. The report mentions that the Commission is considering whether to seek powers to transfer canals 'no longer justified as part of the transport system' to other authorities more concerned with their continuation —mostly narrow canals, representing some 760 out of the total of 1,760 miles of canals in this country. Statutory and administrative delays which prevent prompt action when the need for increased charges has been recognised are described in the report as a disabling handicap; last year £15 mill. was lost in this way—more than the final deficit. Details are given of many economies which the Commission has made and the obstacles which often operate against them; for example, 11% has been saved on costs per train mile since the Railway Executive took over, but the Executive does not refer to excessively low speeds of trains and the very real wastage of travelling manpower involved. 'Net ton miles per engine hour'—a mathematical formula new to us—have increased from 450 in 1938 to 578 last year, doubtless due to improved engine design, to developments before nationalisation. Attempt is being made to recast the whole system of transport charges, particularly railway charges, which have been taken over from an age when the pattern of trade and travel was quite different and considerably faster. A new scheme to be submitted to the Transport Commission by August 6 involves complete revision of the general classification of merchandise.

Personal

Mr. E. E. Williams, Manager of the Llanidloes undertaking, has been appointed Manager of the Towyn and Aberdovey undertaking of the Wales Gas Board.

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The Board of the Consett Iron Company, Ltd., announces the appointment as local Directors of **Mr. F. G. George** (Manager, Works Development), **Mr. H. V. Tomlinson** (Manager, Coke, By-Product and Brick Works), and **Mr. S. Bates** (Secretary).

◇ ◇ ◇

Mr. V. W. Press has been appointed London Area Sales Manager of Lancashire Dynamo & Crypto (Mfg.), Ltd. Mr. Press joined L.D.C. in 1934 and is well known in the gas industry, having specialised in the electrification of gasworks and in the application of variable speed drives in gas boosting machinery.

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Mr. L. A. C. Bartlett, A.M.I.MECH.E., and **Mr. W. A. H. May,** M.C., have been appointed to the Board of George Kent, Ltd., London and Luton. Mr. Bartlett has been with the Company for 25 years, entering as an apprentice. After service in most of the departments, he was, in 1939, placed in charge of research on automatic control systems. During the war he was responsible for the handling of Admiralty contracts and was appointed Luton Sales Manager in 1945. Several months ago he was made Commercial Manager. Mr. May, who is a great-grandson of the founder, joined George Kent, Ltd., in August, 1938, as Personnel Manager. He served for nearly seven years in the Royal Engineers during the war, reaching the rank of Major and winning the Military Cross. He returned in 1946 and is now Administration Manager.

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Mr. W. G. Souter, for some years Assistant Secretary of the employers' side of the Southern Joint Industrial Council for the Gas Industry, has retired from the Portsmouth group after more than 45 years' service. Having joined the Portsmouth Company as a junior clerk in 1905 he became Assistant Secretary of the Portsmouth and Gosport Company in 1946, and on the nationalisation of the industry he became Registrar. In an appreciation in the current number of the Southern Gas Board Magazine, Mr. S. E. Whitehead, Deputy Chairman, writes that for 17 years Mr. Souter did the bulk of the secretarial work for the Joint Council, and adds: 'The happy relations which existed between the two sides of the old Southern Joint Industrial Council for many years were in great measure due to Mr. Souter's good work and cheery personality.'

Obituary

It is with great regret that we announce the sudden death of **Thomas Sharp Riley,** M.C., of James Hendry, Ltd., Kingsway. Though not directly connected with the gas industry, he claimed a wide circle of friends therein through his membership of the Evening Star Lodge and Chapter. Of the former he was Master in 1946 and was elected Treasurer in 1949. Cremation is in Brighton this day.

Armco, Ltd.—In the advertisement of Armco, Ltd., on p. 679 of the *Journal* of June 13 (Institution Number), there was an error in the telephone number. This should have read 'MAYfair 4756-7-8.'

The Institution of Gas Engineers announces that Comm. No. 375/176, being the paper entitled 'The Production of Town Gas by the Catalytic Gasification of Petroleum Oils,' by H. Stanier and J. B. McKean, presented at the 16th autumn research meeting last November, is now available in 'grey book' form at 2s. 6d. a copy, post free.

South Western Tar Distilleries, Ltd., Eling House, Totton, Southampton, has been registered as a private company to acquire that part of the undertaking and goodwill of Burts and Harvey, Ltd., which relates to the tar distilling interests of the company in a co-operative tar scheme operating under the trading name of South Western Tar Distilleries. The nominal capital is £100.

Llanelly Meeting.—We have received preliminary notice from Mr. K. E. Tiddy, Hon. Secretary, that the Autumn Meeting of the Wales and Monmouthshire Section of the Institution of Gas Engineers will be held at Llanelly on September 19. Mr. A. Pickard, Chairman-elect of the Section, is Convener of the Swansea Group Committee and Engineer and Manager of the Llanelly and Gowerton undertakings.

A Verdict of Accidental Death was recorded at St. Pancras on July 16 on a woman who was killed while ironing. It was stated that Miss Emily Harriet Adey, 84, of Liverpool Road, Islington, N., died from shock due to burns caused when her clothing caught alight at a gas ring. Mrs. Ethel Parsons, who lived in the same house, said Miss Adey used an old-fashioned iron which she heated on a gas ring close to the floor.

News in Brief

Recommendations made in the Fourth Report of the Gas Cylinders Research Committee of the Department of Scientific and Industrial Research (1929) were adopted in B.S. 401 (steel cylinders for the storage and transport of liquefiable gases). That standard included a table, reproduced from the same source, giving recommended filling ratios for ten liquefiable gases.

Innoxa (England), Ltd. (Innoxa Laboratories), and associated companies, will, as from July 23, be resuming occupation of their pre-war premises, No. 1, Eden Street, Hampstead Road, London, N.W.1. Repairs to the building, which was damaged by enemy action, have now been completed. The administrative, general, sales, and order offices will be at this address (telephone: Euston 8575-9; telegraphic address: Alberdrug Norwest London), while the purchasing and works offices will remain at 233, Balls Pond Road, N.1.

Powell Duffryn Carbon Products.—The Boards of Powell Duffryn Carbon Products and of Great Lakes Carbon Corporation of New York announce that they have reached an agreement under which a jointly owned company, British-American Carbon Corporation, has been formed in the United States to manufacture and sell carbon and graphite and a wide range of carbon and graphite products. The new company will be the sole producer in the United States of carbon and graphite manufactured directly from coal by the Powell Duffryn 'Delanium' process. Powell Duffryn Carbon Products, Ltd., is a wholly owned subsidiary of Powell Duffryn, Ltd., and was formed in 1947.

Balloon Invasion.—'Mr. Therm' balloons from the North Thames Gas Board have now invaded the Continent and quite a number released from Chalkwell Park in the Southend district have been returned from Holland or have been discovered at sea off the Dutch coast. A Dutch captain gave the latitude and longitude of a partly deflated balloon which he fished from the sea. One balloon was returned from Papenburg, Germany, and one from Oskarshamn, on the east coast of Sweden.

St. Helens Town Planning and Development Committee is considering plans for a major development by the South Lancashire group of the North Western Gas Board in connection with which application has been made for the erection of a 5 mill. cu.ft. gasholder, workshops, garages, and storage buildings. The scheme is linked with a gas grid system connecting towns throughout the group. During the war a 3 mill. cu.ft. holder costing £96,000 was built at St. Helens, and the new holder will be one of the largest in Lancashire.

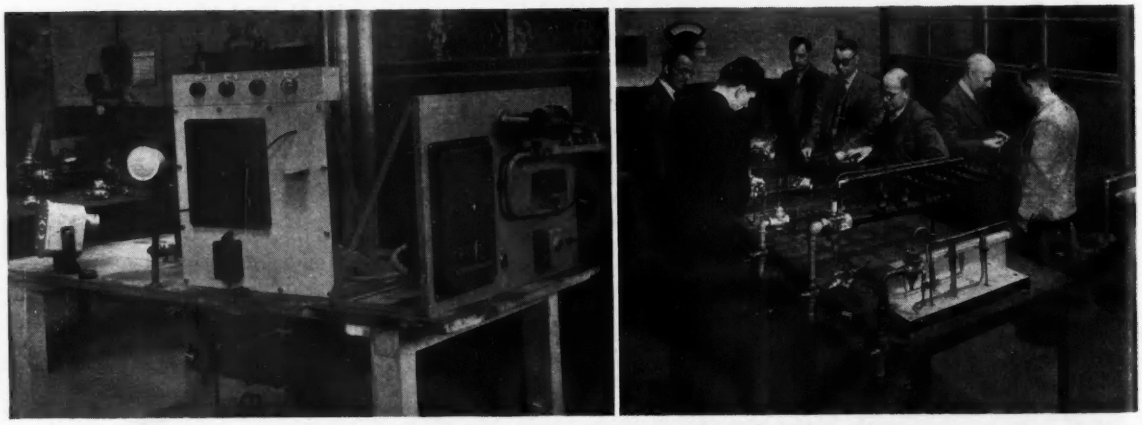
Gas Board's Claim

Leeds Corporation has been served with a writ by the North Eastern Gas Board, claiming £123,000, which it contends was due to the Board when the city's gas undertaking was nationalised on May 1, 1949. The corporation disputes the claim. A hearing is down for the Chancery Division. The £123,000 is made up of two sums which were the profits from the corporation's gas department.

The money was used for general rate purposes about two years before vesting date. The amount of the claim is equal to a little more than 8d. in the pound rate.

The Corporation received £91,000 last November as token payment for take-over of the gas undertaking.

MAINTENANCE LECTURES FOR NORTH EASTERN PERSONNEL



The North Eastern Gas Board recently organised a series of lectures for maintenance personnel dealing with the operation, installation, and maintenance of all types of flame failure devices. A total of 170 maintenance and industrial personnel attended the lectures, and preceding the practical demonstration of the devices the method of operation, the salient points in construction, and the merits of the various types of devices—i.e., bi-metallic thermo-electric, and electronic, were dealt with. The photograph on the left shows some of the equipment in the industrial workshops, while that on the right is of a practical demonstration in progress.

THE *JOURNAL* REVIEWS

New Films for the Industry

ON Friday of last week we attended a Press pre-view of two new Gas Council films at the Hammer Theatre, Wardour Street, W.1, and in welcoming these additions to the Council's library of films—now numbering more than 50—we summarise our impressions in the following brief review.

The first ('Facts and Fancies,' an 18-minute film produced by Public Relationship Films, Ltd.) seeks to indicate the vital necessity of gas and its by-products not merely in the common form in which they are generally recognised but rather in the manifold different objects which form part of our everyday life. The industry's ambassador—Mr. Therm come to life in the shape of a ubiquitous little man looking (was it intentionally?) exactly like the generally-accepted conception of a civil servant, even to the black hat, brief case, and rolled umbrella—takes an 'unbeliever' (one Mr. Brown) in a lightning and breathtaking tour of a gas and products works. They are whisked aloft in a coal grab, tear up and down ladders, and hurtle perilously over rooftops while all the time the guide delivers an unbroken commentary at the rate of at least 200 words a minute without even pausing to draw breath.

He leaves the 'unbeliever' (and to some extent the audience too) shaken and bewildered in the works office after offering him an aspirin—made of course from coal—to steady his nerves.

But Mr. Brown remains stubbornly unconvinced—in spite of the guide's jack-in-the-box reappearance on the way home as a shop assistant to sell him a few more household articles made from coal. So he is challenged in his own home to do without all the many things in everyday use which come from the gas industry. We are not sure whether it was the loss of his trousers or the threat of no more brown ale which finally turned the scales. At any rate the film closes with a happy shot of the 'ambassador' and a now thoroughly convinced Mr. Brown drinking each other's health in a miraculously restored bottle of 'brown.'

The film undoubtedly gets across in a forceful and amusing manner the extent

A 'still' from the film 'What's Cooking?' with Mr. Philip Harben in the foreground.

to which we rely on the products of the gas industry in every phase of our ordinary daily lives. Whether the import of the lightning commentary on the works can possibly sink into the mind of a lay audience, however, is another matter altogether.

The other film ('What's Cooking,' produced by the Regent Film Corporation, Ltd., and running for 35 minutes) stars Mr. Philip Harben, the Television Cook, on the one hand and Terry Thomas and Michael Bentine on the other.

Instruction and humour are skilfully blended in this film, which is very good propaganda for the gas cooker. We were reminded a little of a previous film 'Method and Madness,' in this mingling of farce and seriousness—a mixture which does not enjoy a universal appeal, though we personally found it highly entertaining. Probably in no place better than the kitchen can slap-stick comedy be developed to more hilarious effect. It was, of course a foregone conclusion after Terry Thomas and Michael Bentine had connected up the new cooker that water would inevitably fountain out of the burners when the gas tap was turned on; but a more novel touch was the telephone conversation through the gas lighter and radio music from the oven. The catching and filleting by surgical operation of an elusive fish was a riot of fun, while the pancake-tossing gave scope for more foolery.

On the serious side, Mr. Harben not only showed how to bake the perfect soufflé in a glass fronted gas oven, but demonstrated clearly and practically the merits of gas cooking and the superiority of the gas cooker in perfection of control, simplicity of construction, and ease of cleaning. We thought this latter a particularly good production which should bring considerable prestige to the gas cooker. Our illustration is a 'still' from this film showing an impressive array of modern gas cookers with Mr. Harben in the foreground.

Both these films are available from the Gas Council Film Library in 16 mm. and 35 mm. sizes.

Diary

July 26.—North Thames Gas Consultative Council: Caxton Hall, Westminster, 2.30 p.m. (Note.—Not Westminster City Hall on this occasion.)

July 27.—Northern Junior Gas Association: Address by A. Pillans, Works Manager, By-Product Works, Northern Gas Board, followed by a visit to St. Anthony's By-Product Works, Northern Gas Board, Newcastle.

July 31.—Gas Council Industrial Gas Development Committee, Gas Industry House, 9.30 a.m.

Aug. 30-Sept. 13.—Engineering, Marine, and Welding Exhibition, Olympia. (Gas Council exhibit).

Sept. 4.—East Midlands Gas Consultative Council: Victoria Station Hotel, Nottingham, 11.30 a.m.

Sept. 6.—North British Association of Gas Managers: Annual General Meeting, Ayr. (Golf and bowling functions, Sept. 5; Excursion, Sept. 7).

Sept. 10.—West Midlands Gas Consultative Council: Dudley Room, Queen's Hotel, Birmingham, 2.30 p.m.

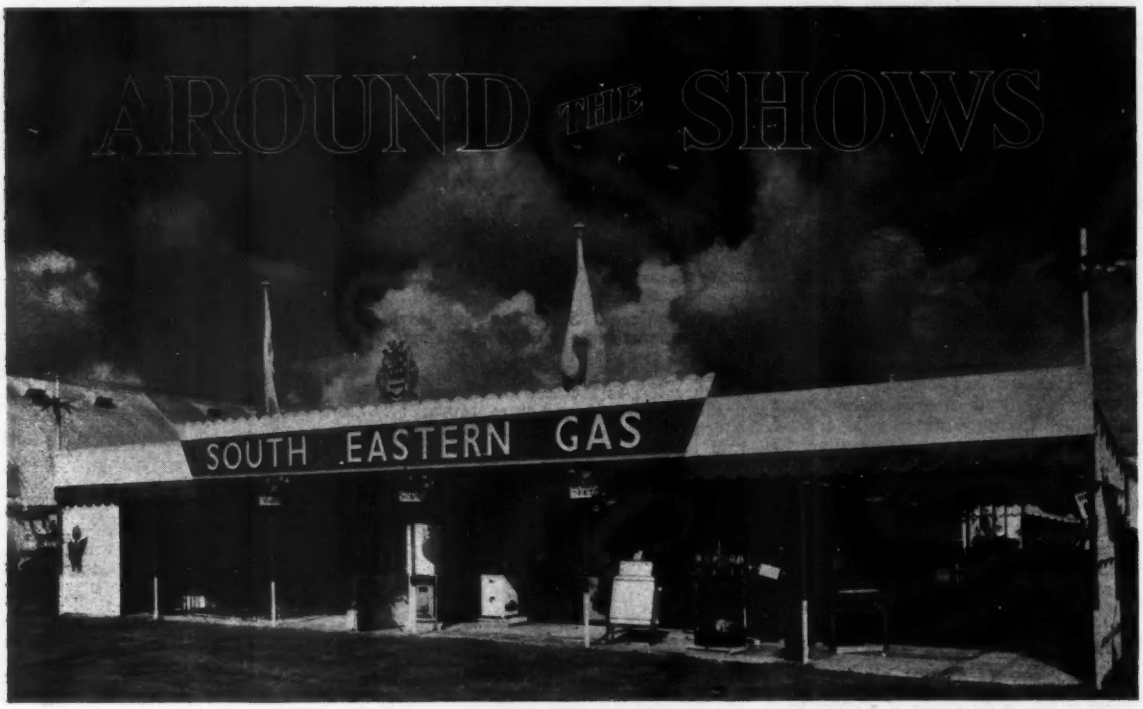
Sept. 17.—Eastern Gas Consultative Council: Connaught Rooms, Great Queen Street, 2 p.m.

Sept. 18-21.—Association of Public Lighting Engineers: Annual General Meeting and Conference, Brighton.

Sept. 19.—South Western Gas Consultative Council: 34, Bridge Street, Taunton, 11 a.m.

Sept. 19.—Wales and Monmouthshire Section, Institution of Gas Engineers: Autumn Meeting, Llanelly.

Sept. 20.—Gas Council Commercial Managers' Committee: Edinburgh, 10 a.m.



THE KENT SHOW

From the 'Royal' at Cambridge we journeyed south-east into the 'Garden of England' where at the Kent County Show in the famous Mote Park, Maidstone, we found the standard of gas exhibits well maintained by the South Eastern Board.

THE county shows reap some advantage in the fact that they often have permanent sites, as in Kent, and consequently many essential services can be laid on on a long-term basis. Thus, in its third year on the same site the South Eastern Board has benefited from past experience and has booked its position for some years ahead.

Designed by the Board's display and exhibition officer and set up and equipped by the local staff, the stand, measuring some 3,000 sq. ft., occupied an excellent position on one of the principal avenues of the show. It had an unusual feature in its slatted wood floor (made up, by the way, of purifier grids) which definitely enhanced the general appearance and overcame the inherent unevenness of the ground. Equipment set out on such a floor seems to be shown to better effect than on worn, and sometimes muddy, turf.

A noteworthy feature of this stand was 'Mr. Therm's Cinema,' where the regular exhibition of films drew a great deal of public attention throughout the two-day show. On the other side of the stand a well-equipped little demonstration theatre was also a centre of interest. In addition to a wide range of domestic equipment, all tastefully set out and many of them connected up, there was a selection of appliances for use on the farm. In this essentially fruit-growing county there was special emphasis on the industry's fertiliser products, not only for fruit but also, of course, for Kent's other staple crop—hops.

Particular use was made of photographic enlargements to portray the industry's contribution to road surfacing with 'Metro' tar and spraying equipment and creosote for preserving hop poles. The applications of coke on the farm for grain and grass drying was also featured prominently, though the layout of the stand was not such as to enable the inclusion of plants in operation, as we have seen aet other shows.

We were glad to note that the gas brooder contained some live chicks, while a gas incubator and bone digestor were also shown to good effect.

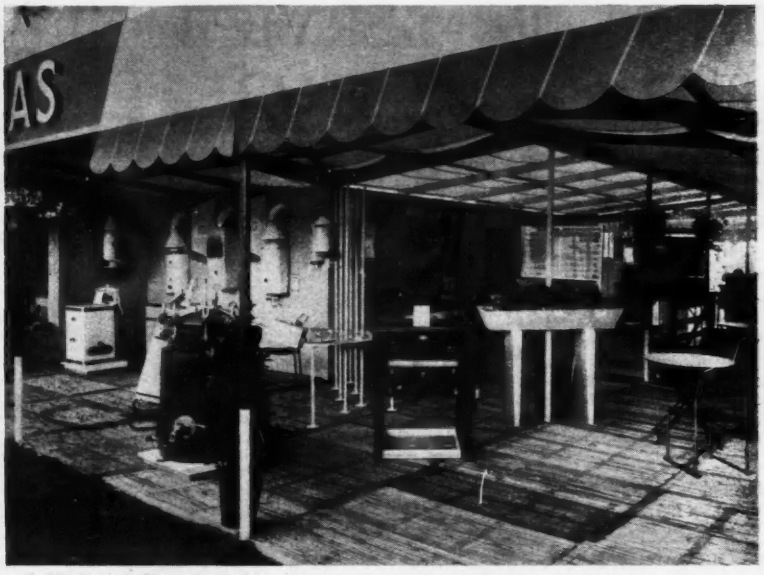
The Board has laid a 3-in. gas main

A typical example of the interested crowd which gathered round Mr. Therm's Cinema at the Maidstone show.

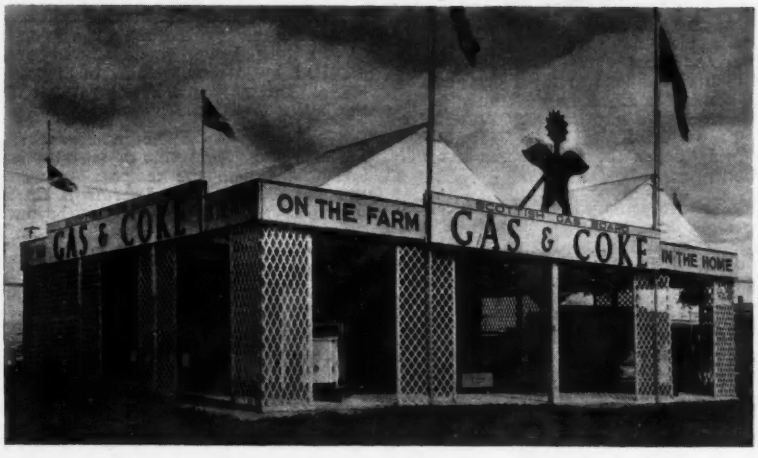
to the showground, which serves, in addition to their own stand, 24 wash-boilers for the provision of hot water on other stands, particularly for tea-making.

The stand was finished in a standard colour scheme of cardinal, lime and white and was surmounted by the Board's crest. It is of interest to note that this display will be moving on in a few weeks' time to the Tunbridge Wells show—which brings us to a final point which is worthy of the industry's consideration.

Bearing in mind the increasing participation in these all-important agricultural shows we commend the idea of each area board setting up a 'pool' of appliances of agricultural interest which can be drawn upon for use at any show in its area. It is not always easy to gather together for each show independently all the equipment which ought to be exhibited to the farmer. We may perhaps suggest a further step in the provision of a prefabricated model dairy which, as we have remarked in our comments on the Royal Show, could readily be erected at local shows to demonstrate all the gas dairy equipment in its proper setting and sequence.



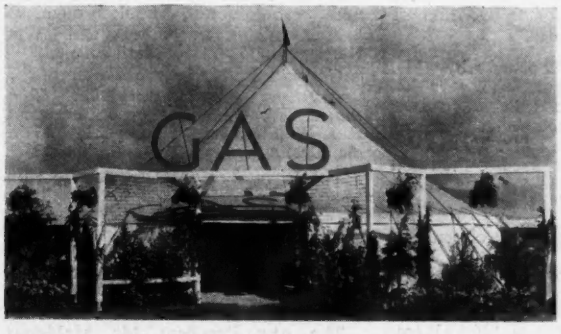
Another view of the South Eastern Gas Board's Stand at Maidstone.



THE ROYAL HIGHLAND

The Royal Highland and Agricultural Society of Scotland held its annual show at Hazelhead, Aberdeen, from June 19 to 22. The Scottish Gas Board took advantage of the opportunity offered by this famous show to stage a fine gas exhibit, and a view of the striking display is shown in the photograph on the left. The stand drew a great deal of public attention and was designed in such a way as to strike a nice balance between domestic and agricultural interests—thereby attracting both the housewife and the farmer. The Scottish Gas Board is to be congratulated on its effort.

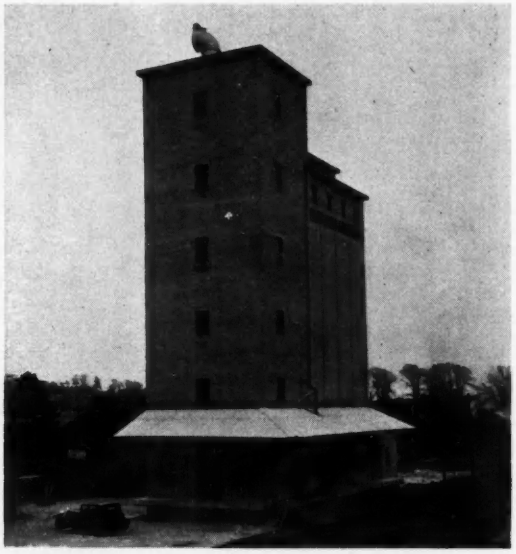
ROYAL CORNWALL SHOW



At the Royal Cornwall Show, Newquay, the South Western Gas Board had an attractive exhibit designed by the Divisional Publicity Department in co-operation with the South Cornwall Sub-Division, following the floral theme used at the Devon County Show at Exeter. Cookery demonstrations given in the marquee during the two days of the show were well attended.

ANOTHER SERVICE TO AGRICULTURE

The following article is reproduced, by kind permission, from the spring issue of the Ipswich Division Magazine of the Eastern Gas Board. The photographs are by A. F. Dann, Maldon



General view of Messrs. Newman and Clark's silo at Halstead.

THE gas heated silo supplied and erected at Halstead, Essex, by Messrs. Newman & Clark is the only one of its type in the country. It was put into operation in December, 1950, and being of an experimental character, the Ministry of Agriculture are closely observing its working results.

The need for additional silo storage throughout the country has been brought about by the marked increase in the number of combine harvesters now in use.

'Volex' gas-fired air heater installed at the new silo.

Previously, the corn after harvesting remained stacked throughout the winter and into early spring, and when subjected to threshing was dry and fit for storage. The combine harvester delivers the corn already threshed, but often in a wet and incompletely dressed condition, which would lead to rapid deterioration if stored for any length of time. Grain from the combine harvester must therefore be dried and dressed ready for storing under the most hygienic conditions.

Silos are equipped with appliances for treating large quantities of grain as they are received from the harvesters. It is quickly dried and stored free from dirt and vermin and facilities are available for subsequent re-drying if necessary. The grain as it is received is carried by an elevator to a hopper situated at the top of the silo building and thence by a series of chutes through the various cleaning, dressing and drying processes, after which it is weighed and passed to the storage bins, 22 in number, with a total capacity of 760 tons. From storage the grain passes, again by chute, to the bagging and loading bays.

The drying process in the Halstead silo is carried out by the aid of a No. 1 'Volex' air heater manufactured and installed by Messrs. Salter, of Tipton, Staffs. The maximum hourly gas rate of the heater is 400 cu.ft.

The temperature of the grain must not exceed 100°F. during the drying process, and to maintain the temperature at a constant level a heat detector is fitted into the hot air duct some 3 ft. beyond the fan, and connected to a 'Spersom' relay type thermostat. A 'Teddington' magnetic valve turns off the gas supply in the event of a failure of the electricity supply to the fan motor.

We wish to express our thanks to Mr. H. P. Newman, of Messrs. Newman and Clark, for permission to reproduce the photographs included with this article and for furnishing details of the plant for publication.

Wales Juniors

The annual general meeting of the Wales and Monmouthshire Junior Gas Association was held at Chepstow under the Presidency of Mr. C. L. Singleton.

The annual report was adopted on the proposition of Mr. S. Armitage (Bristol), seconded by Mr. K. Muir (Wellington Tube Works, Ltd.).

The Treasurer's report, which was read by the Treasurer, Mr. C. E. Banham (Cardiff), showed an addition of 70 members in the North Wales area.

The following officers were elected:

President: S. G. Meade (Newport).
Senior Vice-President: H. Buckley (Pontypool).
Junior Vice-President: R. Jones (North Wales).
Secretary: R. Sheppard (Neath).
Treasurer: C. E. Banham (Cardiff).
Librarian: J. Newman (Pontypool).
Council: A. D. Mason (Cardiff), T. Tyrrel (Port Talbot), D. E .Wilkins (Swansea).

Northern Juniors

The Northern Junior Gas Association held its annual general meeting at the Queen's Hotel, Stockton, where they were the guests of the Stockton Division of the Northern Gas Board.

The meeting was opened by Mr. G. W. Perks, President, who gave his address. This will be dealt with subsequently in the *Journal*. A vote of thanks was proposed by Mr. W. R. Garrett, Newcastle, who referred to the rapid growth in output of the Stockton unit—133% in a matter of 11 years.

The following officers were elected:—

President: J. E. McManus, Howdon.
Senior Vice-President: R. Williamson, Sunderland.
Junior Vice-President: S. Jones, Middlesbrough.
Hon. Secretary: R. Aynsley, Newcastle.
Hon. Treasurer: W. O. Kirkwood, Sunderland.
Hon. Transactions and Publicity Secretary: S. Jones, Middlesbrough.
Hon. Auditors: A. O. Old, West Hartlepool; D. Yule, South Shields.
Council: P. N. Lee, Middlesbrough.
Northern District Education Committee: W. O. Kirkwood, Sunderland; F. J. Webster, West Hartlepool; C. Hindle, Darlington.

The Council resolved to elect to Hon. Membership W. O. Kirkwood (Chairman of the North of England Section of the Institution of Gas Engineers), and S. Jones (Hon. Secretary of the North of England Section of the Institution of Gas Engineers), while retaining their ordinary membership of the Junior Association.

The new President, Mr. McManus, presented the S.B.G.I. Silver Medal to Mr. G. E. Haddon, of Stockton, for his paper 'Distribution of Gas.'

British Instrument Industries Exhibition

The first exhibition to be devoted exclusively to the British instrument industry was held at Olympia from July 4-14. Coinciding with the Festival Year, the exhibition provided an opportunity of demonstrating to the world the contribution of British instrument makers to maximum production efficiency.

MORE than 150 leading manufacturers in the instrument industry exhibited, including a substantial number of firms whose products are well-known in the gas industry. We cannot, of course, describe everything we saw or hope to do full justice in the space available to all the highly scientific and technical equipment displayed. We have, however, selected for brief mention a few of the many items which are of direct or indirect interest to the gas industry in its various branches.

BRISTOL'S INSTRUMENT CO., LTD., stand represented the latest developments in instrument design incorporating many exclusive features the result of over 60 years' experience. Their new Series 500 offer a wide range of pneumatic controllers in which the control response is calibrated and reproduceable in all instruments. The basic principles of operation for which Bristol instruments are well-known have been included in this new Series together with many improvements that make them easier to use, more convenient to service, simpler in construction, and readily convertible from one type to another.

BRITISH ARCA REGULATORS, LTD., showed a diaphragm-operated valve with compensator; pressure relays, direct action and reverse action; room type humidistat; direct and reverse action thermostat; pilot valve in quarter section; oil pumping set of 150 gal. per min. capacity, complete with hydraulic power cylinder and gas pressure regulator; recorder type electrically operated temperature controller with standard thermostats, humidistats, relays, and indicators; and the Arca patented single-seated balanced and ported valve in quarter section, fitted with electrically operated motor head.

THE CAMBRIDGE INSTRUMENT CO., LTD., display demonstrated the comprehensive range of this firm's products. Industrial instruments included many types of indicators, recorders, and automatic controllers for temperature-vapour pressure, mercury-in-steel, electrical resistance, thermo-electric, radiation, and optical; humidity indicators and recorders; pressure and vacuum gauges and recorders, etc.; electrical instruments; engineering and physical instruments. Chemical engineering and gas analysis—*p*H meters, indicators, recorders, and controllers, titration apparatus, polarographs and voltamoscopes, electrical CO_2 and CO indicators and recorders, dissolved oxygen recorders, furnace atmosphere controllers, exhaust gas testers, etc. Many of these instruments were shown on flush-mounted panels.

CHANCE BROS. LTD., showed examples of laboratory glassware and optical glass; also the 'Flamemaster' Mk. 2 burner with new flame jets and accessories, and Bornkessel burners.

CINEMA-TELEVISION, LTD., demonstrated among many interesting instruments an industrial electronic metal detector for detecting the presence of ferrous or non-ferrous metal in any non-metallic article; also electronic frequency meters, cathode ray tubes, photo-electric cells, and a personal radiation monitor.

ELCONTROL, LTD., exhibited electronic safeguard equipment for furnaces, together with a selection of electronic controls to meet individual problems. Many of the units were shown in operation either with actual loads, working models, or coupled to indicating lights, from which it was possible to visualise their applications to industrial processes. Two versions of the furnace safeguard equipment give immediate fuel cut off on flame failure in gas and oil furnaces respectively. The units are not only valuable safety devices, since they greatly reduce explosion risk; they also lend themselves to incorporation in fully automatic ignition controls giving push-button start, and can readily be linked with temperature controllers where required. Standard furnace safeguard equpment was demonstrated in use on a model gas burner.

A REVIEW OF THE STANDS

ELECTROFLO METERS CO., LTD., included in their striking display many items of interest to all branches of the gas industry—manufacture, supply, and utilisation. For the works chemist was a pneumatic transmitter by which accurate measurement of viscous and corrosive fluids can be made without the use of electricity. The meter may be calibrated to measure flow, pressure, density, or level. For the distribution engineer was the new low-differential gas flow meter for use with orifice plates in supply mains. This design enables gas at the lower velocities to be accurately measured and flow rate readings transmitted over any distance to a central control point with a minimum loss of head. The Electroflo retort house governor was demonstrated to show its high sensitivity and speed of response. A complete range of automatic controls was shown, including the latest electronic equipment for the precise control of gas furnaces.

ELLIOTT BROS. (LONDON), LTD., showed their equipment for temperature measurement and process control, including potentiometer recorders, trimode controllers, and a full range of indicating, recording, and transmitting flow-meters for liquids and gases; also the Elliott thermal conductivity CO_2 meter and optical and total radiation pyrometers for temperatures up to 2,200°C.

THE ENGLISH ELECTRIC CO., LTD., had examples of panel instruments mounted on control cubicles representative of the latest flush-mounting types, together with electronic instruments and working demonstrations of a portable insulation tester.

ETHER, LTD., featured their electronically operated temperature controllers made under the Wheelco patents. Among these was the Ether-Wheelco 'Flame-o-Trol' combustion safeguard with ignition torch and other accessories, optical pyrometers, and solenoid operated valves.

EVERSHED AND VIGNOLES, LTD., had as their principal exhibit an Evershed 'Centroller'—a self-contained control unit for the centralised operation of a chemical process plant. This was in the form of a desk or console on which was mounted the many controllers and recorders necessary for the efficient operation of the plant. Mounted on the unit was a control diagram containing a number of miniature edgewise indicating instruments inserted into the diagram at the appropriate points of measurement, some having double pointers—one to indicate the actual measured value while the other showed the desired value.

THE FOSTER INSTRUMENT CO., LTD., demonstrated their thermo-electric pyrometers, portable potentiometer for test purposes, and various types of switches, thermo-couples, flush-fitting dial recorders and resistance elements. A working exhibit of interest was their large-scale illuminated indicator to meet the need for an instrument which can be accurately read from a considerable distance. Although part only of the full scale is visible at one time, any position may be brought into view by a simple adjustment of the scale selection knob. The visible portion covers just over 200°, which is more than sufficient for normal deviations from the optimum working value.

HONEYWELL-BROWN, LTD., showed a circular chart recorder controller with three-term pneumatic control, a multi-point precision indicator with integrally mounted thermocouple switches, single and multipoint strip chart recorders, and combustion safety systems, operating on the principle of flame conductivity, to provide instantaneous shut-down in the event of flame failure. All these exhibits were in operation.

GEORGE KENT, LTD., had a very impressive stand showing an extensive range of industrial instruments for measurement and automatic control. Instruments were demonstrated for

measuring or controlling flows, temperature, pressure, liquid level, *p*H, conductivity, CO_2, O_2, SO_2, specific gravity, frequency, and for the automatic control of large steam generators. Working models included measurement of O_2 content in coal gas, while a special feature was a complete model of a modern central control panel with instruments for a large power station.

E. N. MASON AND SONS, LTD., showed their mercury plan printer, which is an entirely new photo copier produced in six models with printing speeds up to 30 ft. per minute or with completely automatic control and self-selection speeds to give similar clarity of print background from old or new tracings. The 'Hermes' plan printer is another new continuous copying machine specially designed for the smaller user.

MUREX, LTD., exhibited a number of lines which have only recently come into production on a commercial basis at this company's works. They included metals used in the chemical industry for acid-resistant vessels and in electronics and surgery. Other exhibits were examples of 'Prolite' cemented tungsten carbide products such as are used for wear resisting parts.

NASH AND THOMPSON, LTD., displayed a number of instruments specially made to customers' requirements; also examples of colour comparator, metallurgical mounting press, furnace controller, aeration test burner, flow control switch, multipoint rapid temperature recorder, glossmeter, flowmeter, paint thickness meter, paint abrasion tester, and chart planimeter.

THE ROTAMETER MANUFACTURING CO., LTD., had representative examples of their flowmeters for gases and liquids together with recording and controlling Rotameters for process control and equipment testing. One such instrument gives an alarm on the failure of a flow or when a predetermined flow is exceeded.

WALKER, CROSWELLER AND CO., LTD., displayed a range of indicators and recording instruments for gasworks and industry generally, including the new Arkon wall or panel mounting pressure/vacuum and gas flow recorders with self-feed chart re-wind and six weeks' horizontal continuous roll chart recording.

ALEXANDER WRIGHT AND CO., LTD., covered the needs of the fuel conversion industries in large measure by a comprehensive display of equipment for determining calorific value, specific gravity, and other factors relevant to gas manufacture. The Boys' non-recording gas calorimeter was shown—being the officially prescribed instrument for determining the thermal value of town gas. A selection from the firm's extensive range of pressure and vacuum gauges was included with a bank of vertical-edgewise scale indicating gauges. A special feature on this stand was the photometer bench and integrating sphere with 'Lumer-Brodhun' and 'Simmance' flicker photometer heads.

Toronto's 10 Million Cu. Ft. Holder

IN a paper at the annual convention of the Canadian Gas Association last June, Mr. G. F. Knight, Works Superintendent, Consumers' Gas Company of Toronto, discussed the construction of a new 10 mill. cu.ft. all-welded holder. Two years ago it was realised that the Company would need additional storage and it was decided to install a column-guided holder of the water tank type.

'Since,' said Mr. Knight, 'the majority of our present holders are of English design and construction, and have given excellent service, the possibility of purchasing this new holder in England was investigated. I found that the British industry have practically standardised on the spiral-guided type, a type that I do not consider entirely suited to the rigors of our eastern Canadian climate. There is only one holder of this type in Canada east of Vancouver, B.C., and I understand it is not used as an active holder during the winter months because the formation of ice on the guide rails seriously interfered with its operation. The approximate prices obtained from the British for a column-guided holder were high compared with prices obtained elsewhere and the promised time of completion was far in the future, being from four to five years.

'Detailed specifications and proposals were obtained from representative and experienced holder builders on this side of the Atlantic and, in March, 1950, a contract was entered into with Dresser Manufacturing Company, Ltd., Toronto, in association with Stacey Brothers Gas Construction Company, Cincinnati, Ohio, for the supply and erection, on foundations to be provided by us, of a 10 mill. cu.ft., all-welded, panel-type holder, with an internal oil storage tank of 5 mill. U.S. gal. capacity.'

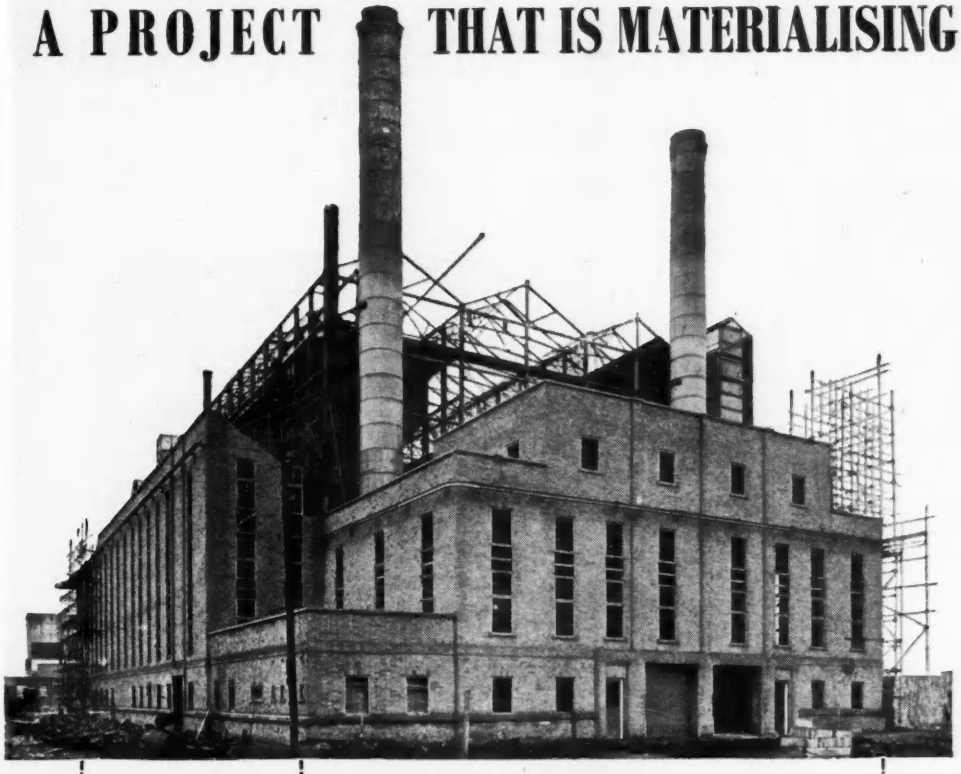
The foundations were completed by June 19, 1950, but it was not possible to start erection of the steel until July 3, 1950. This work continued during the summer but a great deal of erection time was lost because of an unusual number of days on which it rained. During autumn the weather became worse, and by December it was decided to suspend work till the spring of 1951. Work was resumed in May, 1951, and the holder will be in service this month. Total working time from start of steel erection to having the holder operating will be less than nine months.

Gas Pipes feeding the Palace of Holyroodhouse, Edinburgh, were tapped on July 7 to provide catering facilities for one of the largest parties ever held in the city. Some 100,000 Orangemen from all over Scotland and Northern Ireland held their annual 'walk' through Edinburgh to the King's Park near by. To feed this vast crowd with snacks demanded emergency supplies which were provided by tapping the mains in the area.

A FESTIVAL EXHIBITION

Walsall's Festival celebrations included a shopping week and window display competition for which the Walsall district entered their Gas Service Centre window. The display, which obtained second prize by public vote emphasised the part played by gas in over 500 local industries and consisted of a representative selection of Walsall-made products. Local manufacturers co-operated willingly by loaning exhibits and the overwhelming response made it possible to stage an interesting exhibition inside the showroom.

A PROJECT THAT IS MATERIALISING FAST...



...TINGLEY

The New Seven Million cu. ft. per day Installation for the North Eastern Gas Board. 72—3¾-ton Intermittent Vertical Chambers with 3 Waste Heat Boilers, etc.

The order has also been received for an extension which will increase the capacity to Fourteen Million cu. ft. per day.

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The 'Centicell' has a very high efficiency in dust removal, without any considerable loss of sensible heat.

It reduces slagging of producer-gas nostrils and combustion chamber silica work, and eliminates much of the heavy maintenance cost of flue cleaning.

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HOWDEN

AMERICAN SPOTLIGHT

Items of Topical Interest from the Contemporary Technical Press of Canada and the United States

A SIGNIFICANT YEAR

A SPAN of one year in the life of an industry, while very short, is a building block which adds to the sum total of our progress. As we look back on 1950 we find it was a year of more than ordinary significance. The gas industry and the A.G.A. marched to impressive new service records. Great new arteries of natural gas reached out in an ever widening arc. The deepening international crisis brought the painful metamorphosis from peace to war preparation.

Through A.G.A. the gas industry marshalled its forces to meet these challenges. Significantly, the Association looked beyond the immediate national emergency to times of normal competition. For example, at the first conference of its kind the attention of top company executives was focused on long term sales strategy. Great promotional forces were set in motion which undoubtedly will have enduring results. But perhaps the most impressive accomplishment has been the development of an offensive spirit in the industry. In short, while 1950 was a year of transition it was also a year in which the A.G.A. built a strong foundation for the future. (*The President, Hugh H. Cuthrell, in an introduction to the A.G.A. report*).

* * *

GROUNDS FOR A SUIT

CUTTING of a home's gas supply through negligence can be grounds for a suit if it results in illness, ruled the Oklahoma State Supreme Court. The court affirmed an Oklahoma county district court decision awarding $350 damages to Mrs. Minnie Gray, Oklahoma City, who claimed Oklahoma Natural Gas Company caused her to catch flu and pneumonia by stopping her gas supply.

She said the utility claimed she hadn't paid her bill, though she had the receipt. She was forced to go out into a blizzard to borrow enough money and became ill as a result. (*Gas Age*).

* * *

DANGEROUS APPLIANCES

A MAJOR crisis in customer service and public relations has reached the glaring headline stage in New York City. Trouble began coming to a head about Christmas, 1950, when several deaths were attributed to gas refrigerators in multi-family dwellings. From that date to May 1, 1951, a total of 18 deaths were recorded as having been caused by faulty gas refrigerators. Health Department files show that 78 deaths were attributed to gas ranges and other gas appliances during 1950 in the same territory.

Unique situation in New York is the existence of many thousands of 20-year-old water-cooled gas refrigerators. Quietly and economically they have done their job, but their very silence has encouraged neglect.

In April, 1951, another gas refrigerator death in Manhattan touched off a sweeping investigation by the City Dement of Health, which ordered an immediate investigation of all gas burning appliances in 120,000 dwellings in two special sections of Manhattan where records indicated major sources of trouble. In the first ten days of careful inspection by the Department the following results emerged: Dwelling units inspected 2,545; defective ranges 1,101; defective refrigerators 119; other gas appliances 72.

Thus, the early results indicate less trouble from refrigerators than had been expected, but a surprisingly large number of potentially dangerous gas ranges.

* * *

WHOSE RESPONSIBILITY?

IT would be easy to brush all this off with some staggering statistics regarding the low incidence of deaths in relation to the tremendous figures of gas appliances in use. For instance, there are 700,000 gas refrigerators in use in New York City. There are 450,000 gas appliances in use in the 120,000 dwellings inspected.

But the fact remains that deaths have been caused. Who is responsible? Most of all, the gas industry as a whole (designer, manufacturer, gas undertaking) is responsible for these conditions. A shameful lack of constructural salesmanship is all too evident in the lingering existence of millions of obsolete, potentially or actually dangerous appliances throughout the country. (*Gas Age*).

* * *

AUTOMATIC IGNITION

AUTOMATIC lighting of top burners of gas ranges for 20 years has not only been perfected and accepted, but has been demanded by the lady of the house as standard equipment on all ranges. Only a small percentage of the ranges sold in this country today are of the fully automatic type, with either separate gas pilots or electric ignition in the ovens. And even here it is recognised that the performance of such oven ignition devices leaves much room for improvement.

On the large majority of ranges sold today ignition of the oven and broiler (griller) is not much advanced since the 'Gay Nineties.' The range, generally speaking, is the only major gas appliance which depends on match lighting of its burners. Yet the range is the bread and butter load of the industry. The inherent advantages of cooking with gas will not stand up much longer against competitive forces—unless the gas range is made the finest fully automatic cooking appliance. (*American Gas Journal*).

LARGEST BAKING CONTEST

THE largest statewide baking contest in history was staged at the 1951 National Orange Show in San Bernardino, California. Some 110 top Southern California cooks performed their culinary magic on 100 automatic gas ranges. Co-sponsored by the National Orange Show and the California Fruit Growers' Exchange, the massive baking exhibition produced 55 championship orange cakes and 55 lemon pies.

As first prizes in the giant bake-off both winners were given their choice of any range used in the event.

The Natural Gas Bureau, acting on behalf of Southern California and Southern Counties Gas Companies, arranged for the gas participation in the giant event. The bureau arranged with the manufacturers to supply ranges for the contest. Each range was pre-tested, adjusted, and its oven calibrated at the warehouse before being moved to the site of the event. On the night before the show, three separate crews swarmed into the auditorium to prepare for the cooking contest. Pre-fabricated pipe was laid, connected and tested, work benches were set up, electrical connections for the automatic juicers were installed, and the ranges were hooked up and tested by skilled servicemen from the Southern California and Southern Counties companies. (*A.G.A. Monthly*).

* * *

GAS FOR HOUSEHEATING

STRIKING evidence of the nation's continued high demand for gas for househeating is shown in returns from a survey recently completed by the American Gas Association which indicated that nearly one million new gas househeating customers are expected to be added to present lists during the 1951-1952 househeating season and that another 900,000 new househeating customers are anticipated in the 1952-1953 season. The expanded survey indicated that approximately nine million dwelling units were using gas for all househeating purposes on January 1, 1951.

The survey covered 290 gas utility companies serving 20,407,000 residential gas customers as at January 1, 1951 of which 8,129,000 were being supplied with gas for all househeating purposes. These companies were serving approximately 90 per cent. of all residential utility gas customers in the United States. According to their plans as at January 1, 1951, these companies expected to serve an additional 919,000 consumers with gas househeating during the 1951-1952 heating season and a further 811,000 consumers during the 1952-1953 heating season. In addition, six Canadian companies reported that they expected to add 3,900 and 3,700 househeating customers during each of the next two heating seasons. (*Canadian Gas Journal*).

Fears of Winter Coal Shortage

Reports of the Coal Consumers' Councils

THE fourth annual reports of the Industrial and Domestic Coal Consumers' Councils, covering the year ended June 30, have been presented to Parliament. Both contain warnings that coal supplies may be short during the coming winter. The Industrial Consumers' Council refers to the deterioration in the coal supplies position in the summer of 1950 and to the exceptional measures which were needed to prevent widespread stoppages in industry at the height of the winter, and adds: 'Unless the improved trend in output resulting from Saturday or overtime working and from rising manpower continues there is a great danger that the country will be faced with another fuel emergency next winter. For some years to come there will be barely enough coal to meet growing inland demands plus essential exports. Certainly there will not be enough coal to give consumers any wide freedom of choice.'

The Council says that rather than risk a decline greater efforts should be made to secure foreign labour in a large way. The Council also advises that should it be necessary to import coal again this year, it should be done during the summer before a crisis arises, and not left to the winter months, when transport facilities are fully stretched.

On the National Coal Board's long-term Plan for Coal, the Council emphasises that the cost of coal is of the greatest importance to industry. The whole country will benefit if coal costs can be stabilised, or better still, if they can be reduced by greater productivity. The reasons for the deterioration in coal quality in recent years are dealt with in the report and the need is stressed for greater supervision and enforcement of good standards at all stages of production and preparation of coal at the collieries.

The Council is anxious that price anomalies due to the imposition of flat rate increases should be removed, and discusses the action the Board is taking to rationalise industrial coal prices.

Reference is made to the growing demand for coke in this country and the Ministry has been invited to prepare a statement on what is being done to meet that demand, as well as to take advantage of export possibilities. Emphasis is again placed on the need for greater fuel efficiency.

The Domestic Council draws attention to the continued inadequacy of the coal supplies provided for domestic consumers, especially as this affects old people living alone and young mothers, as well as those people who are entirely dependent on solid fuel for cooking and water heating. The Council also says that deficient supplies of coal are by no means completely compensated by the increased use which is being made in some homes of gas, or of electricity to the detriment of industry.

The Council refers to the arrangements made for some 800,000 tons additional house coal to be made available this summer for consumers' current use or to lay by for the winter, and for the rebuilding of merchants' stocks to a higher level than last year. While appreciative of these plans, the Council says that unless there is co-operation by all concerned and the increase of 800,000 tons is reinforced by an increased winter supply programme, domestic consumers may not be much better off.

The boiler fuel position has been very unsatisfactory, and the Council has asked for improved distribution of whatever supplies of fuel—particularly of coke—may be available so that there may be no setback to the installation of improved cooking and heating appliances.

The report discusses the question of quality and says that there is some improvement due to the better preparation of the coal at the pits, but that there is still considerable room for improvement.

The introduction of the National Coal Board's scheme for simplifying the identification of house coal qualities by consumers and for levelling prices within zones is welcomed by the Council, because it does three things which the Council regards as important advances from the consumers' point of view, namely: (a) it reduces the vast number of house coals into a small number of groups for pricing purposes; (b) it introduces the principle—subject to certain exceptions which it is hoped will only be temporary—of one quality one price to merchants at any depôt in a given zone whatever the source of origin of any particular consignment; and (c) standardises merchants' margins throughout suitable areas, so that prices are not only uniform to the merchants, but to consumers as well.

The Council stakes a claim for more solid fuel for domestic consumers and considers a comprehensive domestic fuel policy to be of urgent national importance.

Both Councils stress the need for improving the quality and cleanliness of coal. The Industrial Council says that 'many of the plants now working were not designed to handle the high dirt content present in the raw coal being mined today.'

The Domestic Council says that there is a growing demand not only for uniformity of prices within the zones, but that there should be one price for one coal all over the country. The Industrial Council is 'perturbed at the further use of the device of a flat-rate increase, applied without discrimination to all qualities of coal.'

Company News

WHESSOE, LTD.

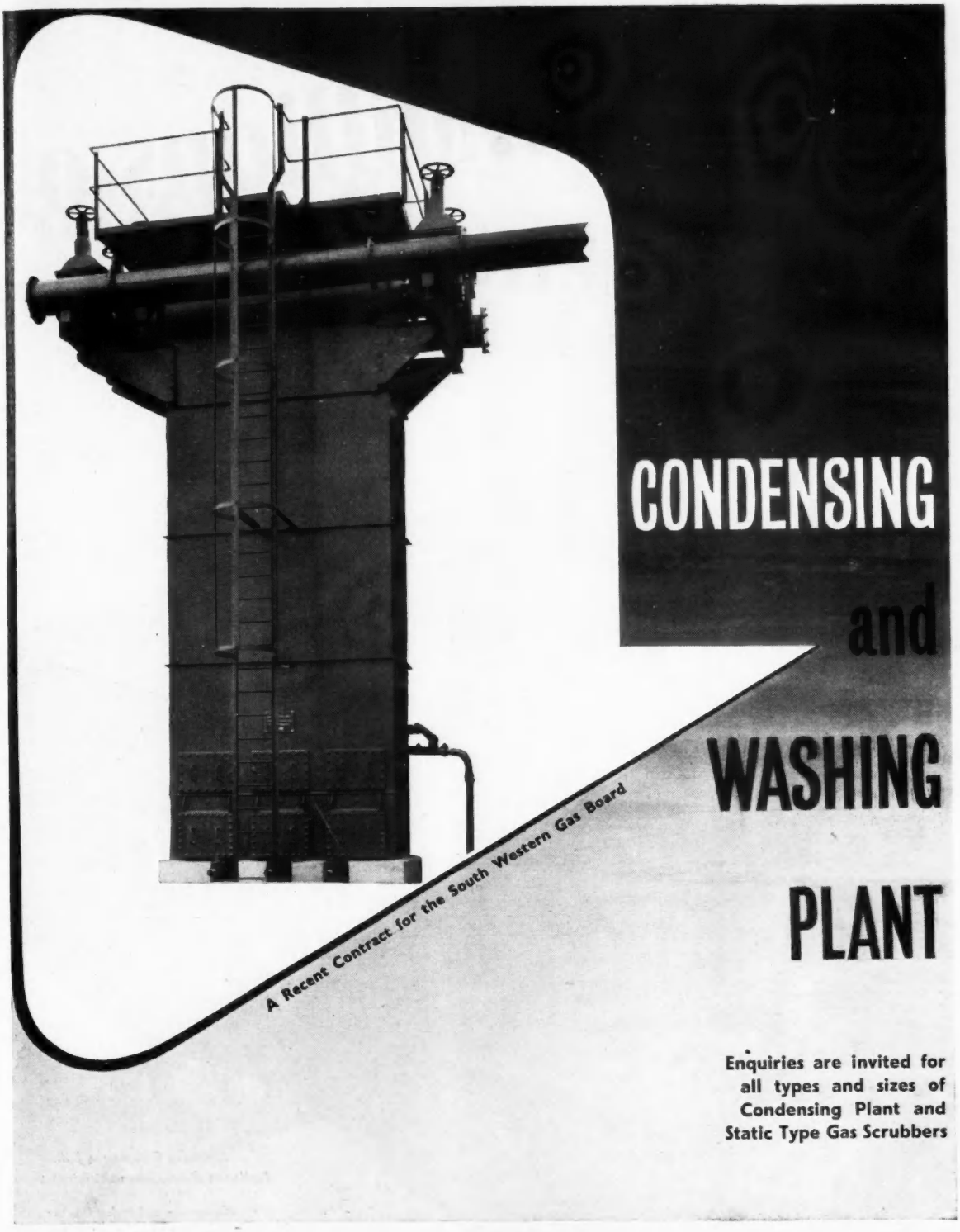
The thirty-first annual general meet- of Whessoe, Ltd., was held on July 19, and the following is from the statement of the chairman, Mr. Harold G. Judd.

The year has again broken records, not only in the volume of orders secured but also in the value of the production and in the profit earned. The main work of our company is the production of storage tanks and of vessels and plant in general for the oil, gas, chemical and steel industries. Few of our contracts reach the Press headlines, but you may have noticed recent references to the hot water accumulator near Chelsea Bridge (part of the Pimlico district heating scheme), to the fractionating columns and spheres at the Shelhaven and Stanlow refineries, and to the gas purification plant at the East Greenwich gasworks, all of which were built by Whessoe.

The profit, after making all deductions (including taxation, £226,760) amounts to £164,788. This has enabled us not only to transfer out of profits £55,000 to general reserve and £35,000 to reserve in respect of works past service pensions and to recommend a final dividend on the ordinary stock of 15%, thus making the usual 20% dividend for the year, but also to recommend a bonus on the ordinary stock of 5%.

DRAKES, LTD.

The Company has maintained last year's turnover and gross profit, but the comparative figures with last year show an increase in the net profit which is caused by certain overhead expenses having become the liability of the new engineering subsidiary. The consolidated accounts include the first year's trading results of this subsidiary, Drakes (Engineers), Ltd., and the directors consider that the formation of this company has been well worth while, and the financial results satisfactory, and likely to be more so, as the old orders in progress at the time of the change-over are completed. No dividend from the subsidiary is proposed, as this is not considered advisable until the company is firmly established. In view of the issue of bonus shares which took place in March of 1951, and which involves a transfer, among others, of £18,217, from the profit and loss appropriation account, it has been thought advisable not to increase the dividend, but it is proposed to pay the usual dividend of 10% on the increased holdings. The issue of bonus shares makes the present issued capital, £125,000, which the directors feel to be more representative of the value of the assets of the company. The trading profit for the year was £90,735 and net profit £41,492.



CONDENSING and WASHING PLANT

A Recent Contract for the South Western Gas Board

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Since 1923 more than two million housewives have become users of **NEW WORLD** Gas Cookers. Most of them are mothers, many are grandmothers, some are great-grandmothers. For nearly thirty years they've all been saying:

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Because for three decades the Radiation policy of Research . . . Development . . . Improvement has produced ever better cookers, easy to install and to service, easy to clean and to keep clean, handsome in appearance, economical in use of gas. That is why housewives of today and tomorrow will go on saying:

"*It's a* **NEW WORLD** *for me!*"

NEW WORLD NEW WORLD NEW WORLD

Power-Gas Corporation, Ltd.

Golden Jubilee 1901-1951

Dr. N. E. Rambush, Vice-Chairman of the Power-Gas Corporation, speaking at the golden jubilee luncheon at the new South Works, Stockton-on-Tees. On the speaker's left is Captain G. R. Chetwynd, M.P.

TO mark their golden jubilee, the Power-Gas Corporation, Ltd., of Stockton-on-Tees, entertained at the week-end of July 14 over 5,000 guests, including workers and their families, on the site of their new 'South Works.'

The Power-Gas Corporation, Ltd., was formed in London in 1901, following experiments and inventions by Dr. Ludwig Mond, in order to exploit the production of plant for turning out cheap power, and one of its first actions was to acquire the business of Ashmore, Benson, Pease & Company at whose Parkfield works there was a competent staff with valuable experience in gas engineering practice. In 1908 the head offices of the Power-Gas Corporation were transferred to Stockton and gradually a complete integration of the activities of the two companies has taken place.

Leaders in Gas Plant

Both have been leaders in the field of gas plant engineering and today they supply plant and equipment for the manufacture, purification, and storage of semi and carburetted water gas, producer gas, carbon monoxide, carbon dioxide, hydrogen, and other industrial gases.

Ashmore, Benson, Pease & Company had specialised in the construction of gasholders and such items of gasworks equipment as purifiers, condensers, etc., as well as iron castings. This trade has been gradually expanded in keeping with the growth of the organisation until today most types of gasworks equipment are manufactured in Parkfield Works. Meehanite castings now account for a substantial production.

Alongside these developments there has been a growing interest in the manufacture of plant required by the chemical industry, with which the gas industry is closely allied in many respects. The suitability of the Parkfield Works for making gas-tight vessels enabled the firm to develop the production of vessels capable of withstanding high pressures and the corrosive effects of many chemicals. The new South Works has been designed to meet the increase in size of vessels now required by process plant manufacturing industries.

While Ashmore, Benson, Pease & Company had already entered the iron works plant manufacturing trade, the Company's real development did not take place until 1928 when an arrangement was made with the Freyn Engineering Company of Chicago and other American companies to construct blast furnace plant and auxiliaries to their designs. Since that time Ashmore, Benson, Pease & Company have held a place in the forefront of manufacturers of blast furnace plant and auxiliaries. It is worthy of note that among their current contracts on the occasion of the Golden Jubilee of the parent company is the construction of a new blast furnace at the Margam plant, a duplicate of one erected in 1950, which is the largest so far put into production in Britain.

The controlling interest has been acquired recently in the well-known firm of Rose, Downs, and Thompson, Ltd., Old Foundry, Hull, which firm specialises in the manufacture of plant for the extraction and processing of vegetable, animal, and marine oils, including whale oil plant.

The combination of experience gained by the firm in these four main fields of activity has led them to a position where they can undertake plant erection services of almost any kind in any part of the world. Such erection does not necessarily imply that the plant is manufactured at the Parkfield Works for they are accustomed to organising for erection plant manufactured in various countries to the designs and instructions of other firms.

In the course of his address of welcome following lunch, Mr. S. W. Berwick, Chairman, said that on that day, Friday, July 13, there was a gathering of both makers and users of gas plant, buyers and sellers, and others representing the State and the civic community generally. He was the only survivor of the original group, Ludwig, Robert Alfred, and Emile Mond, who had met in London and with whom he spent nearly two years. It was a source of gratification and wonder that, in spite of the impact of two world wars, it had been possible to keep their forces together and advance on a world-wide scale. About 22 years ago, when business was in its lowest ebb on the North-East Coast, his company was negotiating for a big advance, and in this connection he went out to Canada, the United States and the Far East, where the World Power, and World Engineering Congresses were being held in Tokyo. On route he visited Chicago and was able to strengthen the links of friendship and trust which had been first formed in the Power-Gas connection and which became an important stage in the recovery of the Ashmore, Benson business. Not only had this friendship helped their business to become leading blast furnace constructors, but it was one expression point of Britain's economic recovery as a nation, a great part of which had been due to American generosity and sacrifice.

In proposing the toast of the Power-Gas Corporation, Ltd., Dr. Alexander Flack, Deputy Chairman of Imperial Chemical Industries, Ltd., said that the foundations of the Corporation had been laid broad and deep, and he paid tribute to the leadership, past and present, which had enabled the firm to render such fine service to the industry of the country. Practically all the blast furnace extensions of the present time were being carried out by the Corporation.

Tribute to the Staff

Dr. N. E. Rambush, replying to the toast, said that the Company had been fortunate in the quality of the men they were privileged to employ, and he had little doubt that the skill of their technicians and craftsmen had been fostered by the constancy of policy pursued by the Directors. An example of this constancy was provided in the fact that the main specialities exploited by the Power-Gas Corporation and Ashmore, Benson, Pease & Company in 1901 served the same industries today—the gas, iron and steel and chemical industries.

They felt proud to have been entrusted with the design and manufacture of the semi-water gas plant at the great Billingham works of Imperial Chemical Industries, which plant produced about 80 mill. cu.ft. of gas per day to meet the basic needs of one of the world's largest chemical factories. They built their first gas generator at Billingham 30 years ago. Since then many other water gas plants had been supplied by them, not only in Great Britain, but in every Continent. For instance, during the last 12 months orders had been secured for the manufacture of carburetted water gas making plant capable of producing about 60 mill. cu.ft. per day. Gasworks equipment was among the products produced in large quantities over the 80 years of Ashmore's existence. Recently they had extended the range of gasholders to include a type quite new to this country, the Wiggins gasholder.

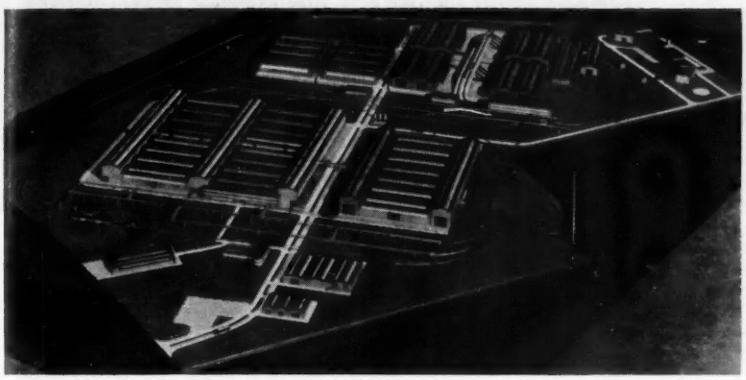
Research in their recently equipped laboratories would be continued and increased since no firm in the plant manufacturing industry could hold its ground

unless research both in processes and on plant manufacture was aggressively pursued.

The toast of "Our Guests" was proposed by Major W. R. Brown, D.S.O., and responded to by Mr. Oliver Smalley, O.B.E., President of the Mechanite Metal Corporation of New York.

The New South Works

In 1948 it was realised that any further extensions to the Parkfield site would inevitably result in loss of efficiency due to congestion, and in January, 1949, the decision was taken to rebuild the works progressively over a period of 10 years. The constructional shop now built at a cost of £600,000 represents the first stage in this reconstruction programme.



Photograph of a model of the proposed development of the new South Works under construction by the Power-Gas Corporation and Ashmore, Benson, Pease, and Co., Ltd.

The general principles behind the layout are that each production department should be provided with twice the floor area which it occupies at present, with room for re-doubling in a logical manner, if so desired. Emphasis has also been placed on flexibility, to cater for the efficient manufacture of larger and heavier products according to whatever the market may demand in the future. Space has been provided also for additional departments to make use of any new materials or processes which may be developed which are fundamentally different from those now in use.

To implement this decision a site of 100 acres was secured about a half mile south of Parkfield Works, and after the overall layout of the factory had been decided, the detailed planning of the first stage was started, which comprised a Construction Shop of 132,000 sq. ft. floor area, together with ancillary services and buildings. To guide the management and to ensure that full consideration was given, not only to the general factors influencing the layout and equipment of the factory but also to the details of each operation and to the amenities and welfare of the employees, a committee was set up from the workers in the present constructional department, on which each type of craftsman was represented. From the early days virtually no decision was taken regarding the selection or positioning of any piece of equipment without the fullest discussion and agreement with this committee.

The first stage is laid out for the manufacture of general mild steel, stainless steel, and non-ferrous platework as required by the gas, chemical, oil and iron and steel industries, and is equipped to deal with plates up to 2 in. in thickness. Twelve overhead cranes are provided, the heaviest being of 50 tons capacity, and the crane tracks in the two heavier sections are designed to take two 50-ton cranes per bay, so that in the future, by the addition of further cranes it will be possible to handle virtually any size or weight of vessel. A stockyard served by rail, road and an overhead crane, is provided at one end of the building for storage of raw materials.

The shop consists of four transverse bays 85 ft. wide by 250 ft. long and 30 ft. high to the crane tracks, and two longitudinal bays 65 ft. wide by 340 ft. long and 50 ft. high to the crane tracks, with the crane tracks of the low bays cantilevered out beneath those of the high bays. Easy transfer of material from the high bays to the low bays and vice versa is thus achieved. The services building, containing the X-ray room, stores, sub-station, etc., is built alongside one of the high bays, and the office, cloakrooms and lavatories are built at one end of the shop.

The main consideration influencing the choice of this layout was the large variety of work which is undertaken and the flexibility needed to maintain a balance between operations and control of work in progress. A further main factor is the desirability of carrying out the main movement of material by cranes other than those required to serve production processes. Following these principles, the bulk of the processes will be carried out in the transverse bays and the end 170 ft. of the longitudinal bays, whilst the main transfer, collection and distribution of material will be carried out in the high longitudinal bays. This layout, it is confidently anticipated, will lead to considerable economies in production by better machine utilisation and a larger output for an equivalent number of employees.

The equipment to be installed includes levelling rolls capable of handling plates 8 ft. wide by 1 in. thick, three sets of bending rolls, the heaviest accommodating plates 12 ft. wide by 1¼ in. thick, two plate-edge planing machines, one 30 ft. long and one double-headed machine 40 ft. long, two guillotine shears, the larger capable of cutting plates 12 ft. wide and 1 in. in thickness and a rotary shearing machine of 1 in. capacity. Continuous welding equipment capable of handling vessels up to 160 ft. long is installed together with full X-ray facilities. The equipment in the press shop, in addition to a range of presses to be transferred from the present works, will include a 1,150-ton four-column flanging press and a 200-ton open-sided progressive flanging press, both of which have been designed by the Corporation's own engineering staff. A producer gas-fired plate-heating furnace 15 ft. wide by 20 ft. long and a bar furnace 25 ft. long are being provided.

Better Scottish Coke

The quality of coke supplied to industry in Scotland has improved so much in recent months that the Scottish Board for Industry has decided that its Metallurgical Coke Advisory Panel will not meet actively unless called on to do so by the metal working industry or the National Coal Board. The panel will remain in being against such an emergency. Formed because of complaints from Scottish ironfounders and other users that coke quality was inferior, the panel has contributed to the improvement in supplies and quality which has since been noted. Ironfounders stressed that the quality of coke is a vital factor in efficient working and that the amount of first class supplies coming forward had been unequal to maintaining efficient production in the foundries. As a result of the initial meetings closer liaison was established between ironfounders and the N.C.B., while effort was made to provide quality to the metal working industry's specifications.

Allied to quality is the problem of quantity. It has been indicated that Scottish ironfounding interests—supplying about one-half of the U.K. light casings exports—have taken 1,150,000 tons per year against 920,000 tons before the war.

Street Lighting Charges

Twenty-three street lighting authorities in the North East decided at a meeting at Newcastle-on-Tyne to protest against gas lighting charges imposed by the Northern Gas Board. One of the main points of contention is the Board's proposal to regard each street lamp as a separate unit. Representatives of the lighting authorities have had an interview with the Gas Board when it was alleged that the Board's street lighting rates were higher than those in several other areas; as street lighting authorities were under a statutory obligation to light streets they should have terms no less favourable than other consumers; mains laid for street lighting were laid for other purposes also and did not involve the Board in extra cost; street lighting by gas was more than twice the cost of lighting by electricity.

The Gas Board was also informed that the new rates had increased the cost of lighting in some towns by 60% to 100%.

The Board has replied that it does not intend to depart from its system of treating each lamp as a separate unit. In some cases street lighting charges had been too low. Since the local authorities protested to the Board there has been a further increase in gas prices.

Thermal Efficiency of

COAL DISTILLATION and GASIFICATION

By

F. J. DENT, D.Sc., Ph.D.,

Assistant Director,
Gas Research Board

In this paper to the North of England District Section of the I.G.E., the Author refers to new processes which, while still in early stages of development, appear to offer opportunity to achieve higher thermal efficiency than existing practice—80% being not, in his opinion, in any way out of reach. They also extend the range of coal available to the industry and minimise plant charges.

THE shortage of production plant following the war years has forcibly emphasised the difficulties associated with the supply of peak load gas and there has been much concern over the charges on the installations which they made necessary. For severe peaks, capital charges are the all-important consideration and thermal efficiency and the cost of raw materials become quite secondary in achieving overall economy. The extent to which this is so is shown by considering a process using fuel at 60s. per ton, operating at 70% thermal efficiency when on base load (300 days) and carrying capital charges equivalent to 0.5d. per therm. Then, if the process were used to meet, for example, a seasonal demand, the charges due to capital per therm of gas made would increase as much as those due to raw materials if the thermal efficiency were to fall as follows:—

Days operations	Increase in capital charges, pence per therm	Corresponding thermal efficiency, %
300	—	70
200	0.25	65.5
200	1.5	49
50	3.0	37.5

For the supply of peak load gas, therefore, a substantial fall in thermal efficiency can be justified if plant costs are minimised thereby. This can, however, be accepted without too much misgiving, since, while peak loads might involve a considerable increase in the daily send-out, they represent a small proportion of the total gas made, and have little influence on overall efficiency.

There is, however, another aspect which merits close consideration. The capital and maintenance costs of plant have increased to such an extent that nowadays, even for base load, the cheapest gas is not necessarily made in plant giving the highest efficiency. This is a matter of some significance, since the pressing national fuel problem, and one likely to persist, is now emerging as a shortage of mined coal. Our aim, like that of other fuel-using industries, must be to make the utmost use of the coal which is brought to the surface and, for this, the highest possible thermal efficiency of gas production is demanded.

These questions arise primarily because carbonisation, as we carry it out with bulk coal in externally heated retorts, is not a naturally efficient process; from early days the plant used has incorporated systems of waste heat recovery. We have now regenerators, recuperators, counter-current flow of coal and heating gases, heat recovery as steam, and steaming of the hot coke discharge. Even so, the efficiency is not remarkably high and, as indicated, is tending to become limited by economic considerations.

From familiarity we may fail to appreciate the fact that heating 20 mill. tons of coal a year to a temperature of about 1,000°C. in refractory chambers is quite a substantial undertaking. The refractories, which demand careful thermal treatment, and the coal charge itself, are not ideal for rapid heat transfer, and, even with reduced dimensions in the direction of heat flow, the process takes 12 hr. or more. One cannot help but contrast it with the almost instantaneous combustion of a coal particle when injected into the combustion chamber of a steam boiler.

Why do we follow such a procedure? There is one main reason—*viz.*, to obtain the solid residue from coal distillation in a saleable form as coke. That is logical so long as the coke contributes its share of the process charges. It is also logical so long as the gas produced is cheaper than that by any other method, and for many years this has been so. We now believe that the position will change, however, as a result of the hydrogenation reaction and methane synthesis offering alternative methods of production by gasification processes which do not use high-priced oil. It is therefore timely to review the fundamentally important aspect of thermal efficiency.

Carbonisation

In considering carbonisation it is salutary to remember that the chemical changes involved during the decomposition of coal into gas, coke, and tar do not in themselves absorb heat but actually result in a small but definite evolution of heat. If all sensible and latent heat were effectively recovered from the products and returned to the system, no externally supplied heat would be necessary for the process of carbonisation.

With coke ovens, which produce the cheapest gas, about 40 therms per ton of coal carbonised are consumed while obtaining a yield of, say, 75 therms of gas per ton. The heat consumption is accounted for as follows:—

	Therms. Per ton of coal.	Per therm of gas.
Losses at producer	1.4	0.019
Sens. and lat. heat producer gas out W.H.B. (240°)	3.9	0.052
Waste gases, out regenerator (300°)	3.9	0.052
Sens. heat coke	11.3	0.149
Sens. and lat. heat crude gas ...	6.1	0.081
Losses at charging, leakage, etc. ...	8.3	0.111
Radiation and convection	3.1	0.041
	38.0	0.505

In other words, an amount of heat equal to 50% of the gas yield is used for a purpose which, theoretically, requires no heat at all and which can be conceivably carried out in practice with not more than 5%. From this point of view the thermal efficiency of gas production achieved of 60% to 65% does not appear as an outstanding performance.

Water Gas

Considerations are somewhat different for the gasification of coke in a water gas generator since, in this case, the reaction occurring—*viz.*, that between steam and coke—does theoretically require the supply of a substantial quantity of heat.

Losses again occur in generating the heat, due mainly to the heat capacity of the coke supplied being insufficient to absorb the sensible heat from the gases which, accordingly, are at high temperature when they leave the generator, and to the production of potential heat as carbon monoxide during the blow which cannot be included in the make gases. It is, however, significant that relative to the amount of heat to be generated, the losses, with internal heating, are much less than with carbonisation and that the fuel produces, say, 180 therms

per ton in 1½ hr.—*i.e.*, more gas in considerably less time than with carbonisation.

Typical losses from a water gas generator are:—

	Therms per therm B.W.G.
B.W.G. and undecomposed steam, sensible ...	0.08
Undecomposed steam, latent	0.12
Moisture in coke	0.01
Blow gas, potential	0.18
Blow gas, sensible	0.10
Generator boiler	0.11
Ashes, clinker and fliers, potential	0.05
Leakage, radiation and convection	0.03
Total	0.68

The steam raised in the generator boiler is of course absorbed in the process and further it is usual to make use of the blow gases for further steam raising and oil cracking. Thus on a C.W.G. plant the final losses might be:—

	Therms. Per therm B.W.G.	Per therm C.W.G. (500 C.V.)
Crude C.W.G. and undecomposed steam, sensible	0.16	0.07
Undecomposed steam, latent ...	0.12	0.06
Moisture in coke	0.01	—
Waste gases, sensible	0.12	0.06
Ashes, clinker and fliers, potential	0.05	0.02
Leakage, radiation and convection	0.05	0.02
Auxiliary steam and power ...	0.05	0.02
Total	0.56	0.25

The principal ones are, first, the sensible heat of the crude C.W.G. and undecomposed steam. This could perhaps be reduced but, on account of the tar vapours, not eliminated and, hence, is more a feature of carburetting than of the operation of the generator. Secondly, there is the loss of latent heat in undecomposed steam, characteristic of most gasification processes operating at high output. Thirdly, there is the loss of sensible heat in waste gases leaving the outlet waste heat boiler and due mainly to the nitrogen in the air.

It is not easy to see how these losses can be radically reduced so long as oil cracking remains associated with coke gasification. Developments are more likely to take place with regard to the use of the two raw materials, in view of the clearer distinction which is now made between the base load and peak load function of water gas.

Thus, for peak loads, preheating of the air and steam might have important advantages when used not so much to secure a high efficiency as to allow the supply of a greater proportion of oil. Tests have already shown that it is possible to eliminate the back-run by preheating the air and steam to 650° and it may be that preheating the steam alone will be sufficient. Without the back-run, the whole run period becomes available for oil injection and the decomposition of oil will also be assisted by higher temperatures at the top of the generator.

For base load, a case can be made out for avoiding the use of oil and obtaining enrichment by catalytic methane synthesis, particularly if the precaution is taken of installing generators of larger capacity than would otherwise be necessary. The reserve capacity would always be available for peak loads by changing back to oil.

When using methane synthesis and having no need of heat for oil cracking, air and steam preheating could then be used to obtain economy in generator fuel. It appears that this might amount to at least 10% and would compensate for the heat liberated during the synthesis itself. There would, however, still be some surplus waste heat only usable as steam or power externally to the process. Thus, from the point of view of efficiency, one can regard the water gas process as being eventually limited by its cyclic nature, allowing carbon monoxide to escape in the blow gases, and, to some extent, by the self-clinkering grate restricting the amount of heat which can be returned to the process by preheating. There is, of course, the further major feature, the requirement of a graded coke as generator fuel, involving as it does the losses associated with a preliminary carbonisation.

Recent Developments

In the light of existing practice one might, therefore, list the requirements of an ideal process as follows:—

(a) A reaction which allows heat to be liberated internally during the distillation of the coal without its products diluting the gas made.
(b) A method of producing additional gaseous hydrocarbons without the use of oil.
(c) A system which allows losses of sensible heat to be minimised by facilitating heat interchange between reactants and products.
(d) A system which treats the coal as powder so that reactions can be carried out at far greater rates than are possible with existing methods.
(e) A method for gasifying the residue from distillation continuously so as to avoid losses of potential heat such as occur in blow gases.

It is just such features which we are attempting to incorporate in the processes being developed at Poole.

Thus the first requirement for the internal liberation of heat is being met by using the reaction between coal and hydrogen which occurs rapidly under pressures of about 20 atm.

$$C + 2H_2 \longrightarrow CH_4 + 0.26 \text{ therm}$$
(1.26 therm) (1.79 therm) (2.79 therm).

Because the product is methane, this meets the second requirement for additional hydrocarbons for enrichment.

It is to be noted, moreover, that when coal decomposes under pressure the available hydrogen which it already contains is all evolved as hydrocarbons, the yield from this source alone being 79-80 therms per ton with a high volatile coal. The additional hydrocarbons needed for a complete gasification process are therefore only about 30 when making gas of 500 B.Th.U. per cu.ft. and about 70 for gas of 650 B.Th.U.

The third and fourth requirements are being satisfied by fluidising the coal, the fact that the system is under pressure allowing high mass flows of hydrogen and steam and, hence, high outputs of gas, without an excessive carry-over of coal dust. Sensible heat losses can be reduced by heat interchange, facilitated by the pressure, and by fluidisation allowing the recirculation of solids to balance heat capacities. There seems to be no reason why gases should not leave at comparatively low temperatures.

Finally, it is proposed to gasify the residue continuously by using oxygen, or by some other means.

(1) Distillation and Hydrogenation

Looking at these processes in a little more detail, the plant suitable for the initial distillation and hydrogenation of the coal would take the form of a tower with several compartments. Coal would be fed in at the top and, being fluidised, would spill over from each compartment in turn and so travel downwards. A gas rich in hydrogen would enter at the base and be responsible for the fluidisation. As the hydrogen passed upwards it would first be preheated by the residue travelling downwards and then reaction and methane production would set in with the generation of a temperature about 900° in the middle compartment. Towards the top, the coal would be distilled by the hot ascending gases which would be cooled in the process. By recirculating residue through the tower, or by heat exchange with the entering hydrogen, it should be possible to cool the gases to the minimum of 400° before they leave the system.

Taking first the distillation stage, the thermal efficiency attainable for a typical weakly caking coal would then be as follows:—

Gas Yield.	Therms per ton.
Methane	74
Carbon monoxide	4
	78

This mixture would be diluted with unreacted hydrogen rich gas to a calorific value of, say, 650 B.Th.U. per cu. ft. and then the heat losses would be:—

Heat losses.	Therms per ton.
Latent heat as water vapour ...	3.2
Sensible heat in gases	3.3
Allowance for radiation	1.0
	7.5

and hence the efficiency of distillation

$$\frac{78}{78 + 7.5} = 91\%.$$

Hydrogenation produces an additional yield of gas equivalent to the difference between the potential heats of the methane obtained and the hydrogen reacting. The associated losses would be as sensible heat in the methane and unreacted hydrogen leaving at 400°, say, 0.11 therm per therm of gas produced, or 0.13 with an allowance for radiation.

Thus the efficiency of gas production by hydrogenation would be:—

$$\frac{1.0}{1.0 + 0.13} = 88.5\%.$$

The overall efficiency of distillation and hydrogenation should therefore be close to 90%.

This takes no account of sensible heat of the solid residue. It should be small if the residue is used to preheat entering hydrogen, but in any case it will not be lost since it will be carried forward to the gasification stage.

Similarly, it is assumed that if, in obtaining a desired yield of hydrocarbons, the heat liberated by the hydrogenation and during the decomposition of the coal is in excess of the sensible heat of the residue and the losses in the gas, the excess will be recovered—*e.g.*, as steam.

Gasification of the Solid Residue

After the distillation and hydrogenation of the coal, to obtain complete gasification requires the gasification of the solid residue and it is proposed to do this by using it to generate the hydrogen-rich gas required. The hydrogen is, of course, obtained from steam by splitting-off its combined oxygen, and three methods, one direct and two indirect, are being considered:—

(1) Direct interaction of the residue in steam using oxygen to liberate the necessary heat.
(2) Decomposition of steam with methane produced from the residue.
(3) A fluidised version of the iron/steam process for hydrogen production using the residue to regenerate the iron.

Gasification in Oxygen and Steam

The use of oxygen as an efficient means for generating the heat required for the reaction of steam with carbon is well known and has been used commercially—*viz.*, in the Lurgi process for the gasification of lignite under pressure using an otherwise normal type of producer with the fuel in a compact bed, and in the Winkler process, also for lignite, with the fuel fluidised, but at atmospheric pressure. In our case both pressure and fluidisation will be combined, and certain advantages are anticipated. Thus:—

(a) While fluidisation avoids the need for a self-clinkering grate and hence allows the sensible heat of the exit gases to be recuperated as high degrees of preheat in the steam and oxygen, pressure will assist the heat transfer and result in a reduced oxygen consumption.

(b) The oxygen consumption will be further reduced because, under pressure, the residue is sufficiently reactive to promote some methane formation at the temperature of steaming.

(c) The turbulent mixing obtained with fluidisation prevents the use of oxygen giving rise to an intense combustion zone in the fuel bed, and the large excesses of steam necessary in the Lurgi process to prevent clinker formation need not be used.

(d) By reducing gas velocities, pressure enables high steaming rates without a disproportionate carry-over of fine particles from the fuel bed.

On the other hand, with fluidisation:—

(a) There is difficulty in withdrawing ash from the system without an undue proportion of carbon.

(b) The carry-over of fine particles, while reduced, will not be negligible.

(c) If advantage is taken of the possible economy in steam, there will be an insufficient conversion of carbon monoxide to hydrogen at the temperature of the fuel bed.

We propose to guard against these features, firstly, by combining a fluidised gasifier with a vortex chamber which will allow all carbon to be removed from the ash before it is run off as a slag and will at the same time gasify dust carried over from both the hydrogenation and gasification stages. For the conversion of carbon monoxide with a minimum excess of steam, reliance will be placed on catalytic reaction which, under pressure, will proceed at low temperatures in presence of sulphur compounds. The overall percentage of steam decomposition should then approach 75%.

Calculation based on laboratory tests of the fuel indicates that each 100 therms of residue will produce 87 therms of hydrogen rich gas, this high efficiency being the result of losses of sensible heat being reduced by heat interchange, of a high percentage decomposition of steam, and of there being no waste gases carrying away potential heat.

About 1 kWh per therm is required, however, for oxygen production and the removal of carbon dioxide by water wash. Half of this can be obtained by expansion of the final gas, but raising the remainder at 30% efficiency will reduce the gasification efficiency to 80%. Then, the overall efficiency of hydrogenation, distillation, and gasification of residue—*i.e.*, of the complete gasification process as a whole —would be about 85%.

Decomposing Steam with Methane

The use of oxygen needs operation on a large scale—*e.g.*, with a gas output of at least 20 mill. cu.ft. and, perhaps, 40 mill. cu.ft. of gas per day. It is therefore to be remembered that its advantages lie mainly in the simplicity and efficiency with which it enables heat to be liberated in a bed of solid fuel reacting with steam, and they would be less in evidence if, for example, it were a question of supplying heat for a reaction between two gases. Such a reaction can be carried out in a tubular system amenable to external heating.

We can make use of this fact to convert the solid residue from hydrogenation into the hydrogen-rich gas required, by continuing the hydrogenation beyond the point at which the hydrocarbons are sufficient for enriching the final gas and then using the excess of hydrocarbons to decompose the steam, over a catalyst.

$$CH_4 + 2H_2O \rightarrow CO_2 + 4H_2$$
$$CH_4 + H_2O \rightarrow CO + 3H_2.$$

This reaction is the basis of an established process. Heat is absorbed as in the carbon/steam reaction, but now it can be supplied by heating the catalyst tubes with producer gas. The hydrogenation of the coal, while extended, would not be taken to completion, sufficient residue being left to make the producer gas. To avoid pressure differences across the catalyst tubes, either the combustion chamber around them would be under pressure or the methane rich gases would be expanded to atmospheric pressure and then recompressed after decomposition. The producer would be similar to the oxygen/steam gasifier, but operated, of course, with air and steam.

The thermal efficiency of the whole process should be as high as 78%, again due to the facilities for heat exchange,

(*Concluded on p. 240*)

FESTIVAL COOKERY COMPETITION

5

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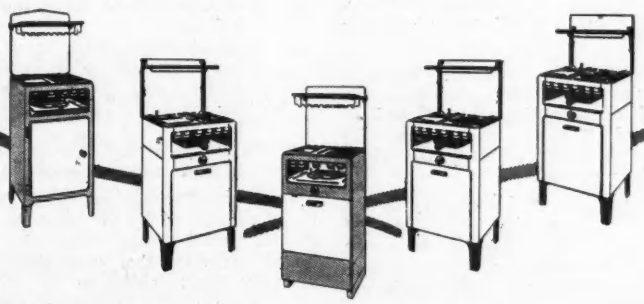

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The Treatment and Disposal of

GASWORKS EFFLUENT

by

Dr. A. MARSDEN

Area Scientist, South Western Gas Board

(From a paper to the South Western Section of the Institution of Gas Engineers at Torquay on May 16)

THE effluent problem appears to be of such outstanding importance that it is worth while to re-examine some of the work already done, in spite of the fact that, to many people, the subject has perhaps become rather hackneyed.

It is well known that by-product ammonia, some years ago, yielded considerable revenue and thus helped to reduce the net cost of coal. More recently, as market conditions changed, only the larger works have continued to process liquor, and they have made very little profit, that which was possible being due largely to special local circumstances such as low transport charges or to the possession of plant which had been written off. The small works proceeded to dispose of the liquor in various ways, some of them being open to criticism but, so long as awkward questions were not asked, no one worried. It is now necessary to face the fact that conditions either have changed, or will do so in the near future, because we are not necessarily entitled to consider problems, involving present-day requirements, exclusively in terms of conditions obtaining some years ago.

Without going into too much technical detail, it is necessary that those concerned should be well aware of the minimum requirements necessary to satisfy the law and maintain the good name of the gas industry while, at the same time, endeavouring to deal with each case on its particular merits so as to keep expenditure down to a minimum, and perhaps, even though it may appear to be a rather forlorn hope, to turn the matter to financial advantage.

The effluent disposal problem may be said to have been under almost continuous review since the Council of the Institution of Gas Engineers set up, in June, 1926, a Liquor Effluents Research Committee, later renamed the Liquor Effluents Sub-Committee, while in 1928 an Ammonia Sub-Committee was constituted and, in 1930, the two were combined in the Liquor Effluents and Ammonia Sub-Committee which, in turn, became the Liquor Effluents and Ammonia Committee in 1934. This Committee continued to function, under the Chairmanship of Mr. C. F. Botley, for a period of 26 years until, during the Presidency of our own Chairman—Mr. C. H. Chester—some of the technical activities of the Institution were co-ordinated, and the Gas Works Effluents Committee was appointed in January, 1950, under the Chairmanship of Dr. H. Hollings,[1] and the old Committee was disbanded.

The new Committee has very wide terms of reference—namely 'To review and advise upon matters concerning the preparation and disposal of all gasworks effluents, and to report to the Council thereon.' It is also co-operating with the International Gas Union in order to study the whole effluent question in the various countries.

A survey has already been made in this country of the methods for effluent disposal on a number of works, and has revealed a divergence among undertakings in the means of effluent disposal, and a non-existence, or at least a considerable lack, of uniformity in agreements regarding charges for effluent disposal.

In the interim period of 26 years, to which reference has already been made, much useful work was done, and reference is made to some of it later in this paper, but one of the highlights was the publication, by the Institution of Gas Engineers, of the excellent book on 'Gasworks Effluents and Ammonia' by Dr. Arthur Key in 1938 (second printing 1949), which contains very full literature references to the whole subject.

It must be admitted that the nationalisation of the gas industry and the passing of the River Boards Act of 1948 have focused attention upon the increasing necessity for the prevention of river pollution, and in 1948 the Institute of Sewage Purification appointed a Committee to consider the matter.

One result of its work was a very useful Memorandum, in the nature of an interim report, to which reference will be made later. Two extremely useful and relatively recent papers have also been presented by Badger[2] and Priestley[3] respectively. These are all considered, particularly from the standpoint of conditions which are peculiar to the South Western area, and while it is not claimed that anything fundamentally new is included in this paper, it is hoped that the following summary of the chief points will assist in producing a dynamic outlook in regard to effluent disposal.

What are Effluents?

In connection with the usual gasworks processes, there are produced various liquids the disposal of which may cause nuisance or pollution troubles. Such liquids may be classified generally, in order of difficulty of disposal, as under:—

(a) Ammoniacal liquor.
(b) Effluent from C.C.A.L. and/or sulphate of ammonia plants.
(c) Effluent from C.W.G. plant tar separators.
(d) Effluent from coke quenching plant.
(e) Liquid from boiler blow-down and the sludging-off of lime-soda water softening plant.
(f) Condensate from reciprocating engines and pumps.
(g) Liquid pumped or drained from syphons, particularly those serving oxide purifiers, drawn off from naphthalene washers, or from gas-oil storage tanks, or overflow water from the tanks of oil-filmed gasholders.
(h) Polluted water which may percolate from dumps or heaps of spent oxide, and from 'tips' on works, and find its way to drains, sewers, or watercourses.
(i) Water produced in separators associated with benzole plants.
(j) Water which may have to be disposed of if it should be necessary to empty a gasholder tank.

The normal sewage and land drainage from works should be taken care of by the drainage system, and it is assumed that the usual routine supervision is given to such matters. It may be noted that when these systems give trouble it is generally due to either:—

(A) Admission to drains, initially installed to deal with

only land water or sewage, of liquids likely to cause blockage, such as ammoniacal liquor or water softener sludge, or

(B) Lack of care in not providing adequate means to prevent, especially during rainy periods, coke dust or similar materials being swept into the drains.

These relatively simple things are frequently overlooked, and ultimately cost much more to rectify than would be spent in labour for their routine control.

What is Meant by Disposal?

In this connection the dictionary definition of 'disposal' is perhaps amusing if not very helpful—namely 'the power, right, or act of bestowing or giving away.' So far as gasworks effluents are concerned we may define disposal as getting rid of the various liquids without any infringement of the law, without causing any nuisance or damage to plant or property, and with the minimum of expense or, if possible, at a profit.

Ammoniacal liquor is dealt with later as a special case, while the effluent from crude concentrated ammoniacal liquor (C.C.A.L.) and sulphate of ammonia plants is also considered under that heading because, apart from the aspect of temperature and, in cases where 'liming' is used, that of suspended solids, the conditions relating to crude liquor apply although, usually, to a lesser degree.

A few practical observations upon the disposal of other effluents listed are submitted below.

Effluent from C.W.G. Plant Tar Separators.—The chief difficulties here are odour and the presence of oily or tarry matter. Careful control of the separators and filters should give an effluent free from oil and tar, but the odour frequently persists. When admitted to sewers, especially if warm, such an effluent can cause considerable trouble and expense, being mistaken for a 'leak of gas' into the sewer. It should be noted that much of the odour can be dissipated by moderate exposure to the atmosphere, especially if the effluent is agitated by passage over small weirs, and it is often possible for this to be done with ease. The coke filter section of the separator should be arranged to provide alternate streams to facilitate changing of the coke, which should be of about ¾ in. and of uniform size. In those cases where traces of oil are persistent, a hessian filter, supported on a light wooden frame, and placed at the outlet of the coke section, is useful. Such filters can be changed readily. In connection with the disposal of C.W.G. plant effluents, some interesting information was given recently by Wedgwood.[4] Apart from odour and tarry or oily matter, it is often thought that such effluents do not present any difficulties, but it is pointed out that such liquids often have high and variable figures for the amount of oxygen absorbed by permanganate.

The Morse Separator

Mention should be made in passing of a very efficient plant installed at a large gasworks in the South West. It is known as the Morse separator and was originally developed in the U.S.A. for the separation of water-oil mixtures of the kind met with in garages and workshops, prior to their discharge into drainage systems.

The separator consists of a rectangular mild steel tank 6 ft. deep, 6 ft. wide, and 24 ft. long, divided into two sections, the first being much smaller than the second. The direction of flow in the first chamber is across the width of the tank, while in the second the flow is lengthwise.

The effluent to be separated flows from a distributor trough on to an inclined tray, designed in the form of a series of corrugations running across the tray and normal to the liquor flow. This tray is inclined at an angle to the level of the liquid in the separator, so that its lower end is submerged. The undulating action of the liquid flowing over the corrugations causes the oil particles to coalesce and either to float off on the surface, or to sink, dependent upon respective densities.

From the first section liquid is taken off just below the surface and caused to flow over the second corrugated section placed at a suitably lower level. At this stage there remains only an infinitely thin oil film, and this is floated off.

The separator is further provided with a variable head for both clean effluent overflow and oil take-off from the first section. A connection is provided at the base of the tank for removal of heavy oil collected there. A direct steam heating pipe, using exhaust steam, is provided in the first section, and the resulting temperature rise assists in the separation of oil and water.

Two separators are installed, each capable of dealing with 25,000 gal. of effluent per day. In 1948, their cost was £1,250 each. The labour required depends upon whether the separators are worked continuously or intermittently. It has been found that about three man hours per day are sufficient for satisfactory control.

A general view of the Morse separators is shown in Fig. 1.

Fig. 1.—Morse Separators.

Effluent from Coke-quenching Plant.—If carbonising conditions are adequately controlled, the effluent from coke-quenching plant should be non-toxic, and the only trouble likely to be experienced is the blockage of drains or sewers, or the 'silting-up' of watercourses, due to sedimentation of the fine coke particles. Adequate settling facilities should be provided so as to produce a satisfactory effluent. Such arrangements soon repay their cost in the saving of labour needed to remove such blockages.

Liquid from boiler blow-down and the sludging-off of lime-soda water softening plant.—In modern plants, where possible, the blow-down from boilers is returned to the softening plant where its alkali and heat contents are utilised. Where such is not the case it may be passed to settling bays together with the sludge from the water softener, but in any case it should not be admitted to drains or sewers without adequate settlement. In large installations it may be economic to install plant for treating and handling the sludge.

Condensate from Reciprocating Engines and Pumps.—Unfortunately this otherwise distilled water usually contains sufficient oil, either emulsified or free, to render its treatment, for use as boiler feed, very difficult, especially where high-duty water-tube boilers are concerned.

Also in many older works, the cost of collection in a hot well, even if structurally possible, is prohibitive on account of the numerous scattered units yielding the exhaust. Where the condensate has to be disposed of into drains or watercourses it is a simple matter to install an adequate oil-separator, or oil-trap, but it is necessary to see that such devices are inspected regularly and cleaned out when required. Rainwater pipes should on no account discharge into the condensate drains. Incidentally, some useful purpose for the recovered oil can generally be found.

Liquid pumped or drained from syphons, drawn-off from naphthalene washers or from gas-oil storage tanks, or overflow water from the tanks of oil-filmed gasholders.—Such liquids as are envisaged under this heading may cause nuisance or pollution in one or both of two ways:—

(1) On account of dissolved gas, if from syphons or mains conveying purified gas, or due to hydrogen sulphide and cyanide or ammoniacal liquor, if from mains or plant dealing with unpurified gas, and
(2) On account of tarry or oily matter from unpurified gas or from oil-washers, gas-oil storage tanks or gasholder tanks which are oil-filmed, or which serve as C.W.G. relief holders.

In both cases the remedies are simple. Thus for (1) ordinary syphon water should not be permitted to enter drains; both this and liquid from foul-gas syphons should always be passed to the liquor well, while for (2) oily water should pass through an adequate oil trap before being allowed to flow to a drain.

It should be noted that syphon liquor from oxide purifiers can be particularly toxic and dangerous; it is also very corrosive. The danger to personnel has been emphasised by the Gasworks Safety Rules Committee of the Institution.[5]

Water produced in the Separators associated with Benzole plants.—The water outlet from such separators should never be connected direct to a drain, but should discharge into a visible oil trap so that should the separator blow due, for example, to failure of the cooling water supply, the crude benzole or naphtha would not be able to find its way to the drain or sewer, where its presence, apart from its toxicity, may lead to the formation of explosive atmospheres. This condensate, which is essentially distilled water, could be used in final ammonia washers because about 8 gal. of water are required to wash the gas from 1 ton of coal and the same volume of gas would need say 160 gal. of wash-oil for benzole recovery. With steam for stripping at 0.5 lb. per gal. of oil, there would result 8 gal. of condensate.

Fig. 2.—Effluent Liquor Filtering Equipment, St. Blazey Gasworks. This is typical of most of the installations.

It is recognised that it is not always convenient to transfer small volumes of water from plant to plant, and also that, at times, the condensate may not be available. Nevertheless, the balance is very close, and the suggestion may be applicable in some cases.

Water which may have to be disposed of should it be necessary to empty a gasholder tank.—The difficulties which may arise in such cases are twofold:—

(1) Nuisance due to dissolved gas, and
(2) That due to small amounts of hydrogen sulphide, or suspended iron sulphide, produced by bacterial action.

The first can usually be overcome by splashing the water over a system of small weirs, or by allowing the pump delivery to impinge against a plate before the water has access to the drain or sewer, while in the second the remedy is oxidation, usually by means of gaseous chlorine or bleaching powder cream, and the details, though simple, are best worked out for any particular case.

Polluted Water which may percolate from dumps or heaps of spent oxide or from 'tips' on works, and find its way to drains, sewers, or watercourses.—It is difficult to generalise on this matter, but technical staffs should take the necessary precautions to see that such liquids are prevented from having direct access to drains or streams. An aspect often overlooked, but which can be very real in its long-term effects, is that polluted rainwater from spent oxide, or from ammoniacal liquor allowed to percolate into the ground, may be a source of considerable cost due to the polluted water reaching wells or boreholes.

Should it be thought that these observations are of a very elementary nature, emphasis can only be laid upon the fact that such happenings are not of rare occurrence.

A relatively new type of effluent has not been mentioned so far, and that is the one from liquid purification plants of the type which appear to be finding favour in this country at the present time. Reference to this matter is made later.

The Special Case of Ammoniacal Liquor

Apart from the national interest, to which reference is made later, the difficulties attendant upon the disposal of crude ammoniacal liquor and, to a lesser extent, the still effluent produced by processing it warrant more detailed consideration.

The whole subject is highly technical, and covers such a wide field that it is convenient to examine it under subheadings.

(a) *Constituents of Ammoniacal Liquor.*—The immediate question which arises is why are these liquids—crude liquor and still effluent—considered to be so objectionable? The answer is that ammoniacal liquor in particular contains certain substances in solution which are toxic to various forms of life, while both liquor and still effluent contain bodies which are capable of absorbing oxygen, particularly from solution. These facts are very important, whether the liquids are passed to sewage plants or discharged into rivers or estuaries.

Table 1 based upon data given by Key[6] gives an idea of the range over which the principal constituents of crude ammoniacal liquor and still effluent may be expected to vary.

TABLE 1.
Grammes per 100 c.c.

Constituent	Crude Ammoniacal Liquor		Still Effluent	
	Horizontal Retorts	Contin : Vert. Retorts	Horizontal Retorts	Contin : Vert. Retorts
Ammonia 'free' ...	1.15–1.98	1.03–1.34	Trace–0.01	Trace–0.01
Ammonia 'fixed' ...	0.23–0.40	0.34–1.09	Trace–0.30	Trace–0.30
Sulphide, as H_2S ...	0.18–0.63	0.14–0.26	nil–0.01*	nil–0.01*
Cyanide, as HCN ...	0.01	0.005	nil	nil
Thiosulphate, as S ...	0.05–0.10	0.03–0.05	0.04–0.08	0.02–0.04
Thiocyanate, as CNS	0.16–0.20	0.19–1.08	0.10–0.15	0.15–0.80
Phenols, as $C_6H_5.OH$	0.10–0.35	0.35–0.55	0.08–0.30	0.30–0.50

* May be present when 'fixed' ammonia is not recovered.

(b) *Causes of Variation and Control of Composition.*—The volume of crude ammonical liquor made per ton of coal may vary considerably due to a number of causes—*e.g.*:—[7]

(1) Amount of moisture in the coal as charged.
(2) Amount of water produced during the decomposition of the coal.
(3) Whether steam is admitted to the charge during carbonisation.

(4) The volume of water supplied to the ammonia scrubbers. Key[6] points out that 5% moisture in coal, evolved without decomposition, produced 11 gal. of liquor per ton while a further 11 gal. may result if 5% of water is produced during carbonisation. In addition, if steam to the extent of 15% of the weight of the coal is used, assuming 50% decomposition, the remainder would yield 17 gal. of water per ton. If 11 gal. are used in the scrubbers, it will be seen that 50 gal. of liquor per ton may be obtained.

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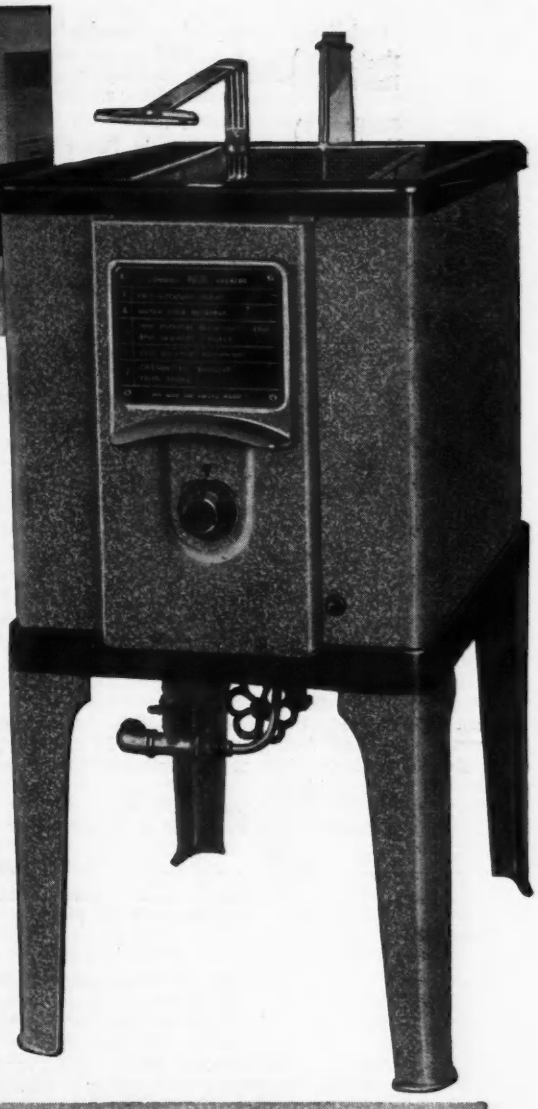

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A very useful simple calculation,[9] which gives results sufficiently accurate for many purposes, can be made from the total ammonia content of the liquor, if it be assumed that the liquor obtained per ton of coal is equivalent to 25 lb. of pure sulphate of ammonia when the coal is carbonised in horizontal retorts, and 30 lb. in the case of continuous vertical retorts.

Gallons of liquor per ton of coal carbonised

Horizontal Retorts: $\dfrac{64.5}{\text{Total } NH_3 \text{ in liquor (grammes/100 c.c.)}}$

Continuous Vertical Retorts: $\dfrac{77.3}{\text{Total } NH_3 \text{ in liquor (grammes/100 c.c.)}}$

Consideration of the four items mentioned above relating to volume of liquor made shows that:—

(1) The tendency to introduce more coal cleaning plants may lead to an increase in moisture content of coal so that the industry must maintain a close watch on deliveries and insist upon the moisture content in coal not being unreasonably high.

(2) The amount of water produced during decomposition of the coal when carbonised depends essentially upon the rank of the coal and its oxygen content, and little can be done about it provided the coal used is satisfactory in other respects.

(3) Steaming applies particularly to continuous vertical retorts, and to a less extent to intermittent vertical chambers, and can be kept under reasonable control so long as the type of coal is constant, but with varying coal and consequently coke of varying reactivity to steam it is a more difficult matter.

(4) The volume of water supplied to the wet purification plant probably provides the greatest scope for control. In the past the strength, and consequently the volume, of the liquor made was looked upon as a very important matter not only in connection with effluent disposal but also from the standpoint of transport and distillation costs. Hollings[10] has given some very useful data showing the relationship between the temperature of the gas entering the washers and the amount of water per ton of coal required theoretically to remove the ammonia from gas, containing 3.5% by volume of carbon dioxide, at different temperatures. These results are reproduced in Table 2.

TABLE 2

Temp. of Gas	Ammonia in gas entering washers (grains/100 cu. ft.)				
	100	120	140	160	180
°F.	gal.	gal.	gal.	gal.	gal.
60	4.5	4.9	5.2	5.6	—
70	6.4	6.7	7.1	7.5	8.0
80	10.4	10.7	11.1	11.4	11.8
90	17.0	17.2	17.5	17.8	18.0

These results show that, in general, the quantity of water required is increased between threefold and fourfold when the gas temperature rises from 60°F. to 90°F. It is not suggested that this knowledge is not well known among gas engineers, but frequently the obvious remedies are not applied. It is largely a matter of attention to condensing conditions, although there are cases where the load on the ammonia washers is increased by using, in the earlier stages of washing, liquor both too high in 'free' ammonia and also too hot.

The control of the composition of ammoniacal liquor is an important matter to which considerable attention has been devoted. In general terms it may be said that the coals used for gas making in this country do not vary widely in their ammonia yields under similar conditions, but the amount of chloride does vary, thus affecting the proportion of 'free' and 'fixed' ammonia in the liquor. However, the type of plant and the conditions of carbonisation, condensation, scrubbing and storage have a considerable effect on the composition of the ammoniacal liquor produced. The chief effect of carbonising conditions is due to temperature, and for that reason I.V.C.'s usually produce a liquor having a composition intermediate between that from horizontal and C.V. retorts. As a general guide Table 3 shows the effect of conditions upon liquor composition.

TABLE 3

Constituents or Properties	Carb. in Horiz. Retorts	Carb. in Contin. Vert. Retorts	Effect of particular circumstance: Hot gas detarring	Storage of liquor in contact with tar	Admission of air before inlet to purifier
Ammonia	Yield less than with C.V.R.	Greater; yield but weaker liquor due to steaming	—	—	'Fixed' ammonia tends to increase.
			—	—	
Sulphide	Greater probably due to less CO_2 in gas	Less than with horiz. retorts	—	—	Tends to diminish.
			—	—	
Cyanide	Greater than with C.V.R.	Less than with horiz. retorts	—	—	Tends to diminish.
			—	—	
Thio-sulphate	—	—	—	Tends to increase with time	Increased.
	—	—	—		
Thio-cyanate	—	—	—	Tends to increase with time	Increased.
	—	—	—		
Phenol	Less than with C.V.R.	Greater than with horiz. retorts	Increased	Increased	—
					—
'Higher Tar Acids'	Less than with C.V.R.	Greater than with horiz. retorts	Reduced	Increased	—
					—
Oxygen Absorption O/A	Considerably less than with C.V.R.	Greater than with horiz. retorts	Increased but liquor more suitable for dephenolation	Increased	Increased

Some of these aspects deserve amplification. It should be noted, for example, that liquors from different parts of the plants show important differences in composition. Liquor circulated in hydraulic mains increases its content of ammonium chloride and higher tar acids, while the thiosulphate and thiocyanate found in scrubber liquor are not primary products of carbonisation but are formed by oxidation of the original sulphide and cyanide. It may be noted here that the admission of crude ammoniacal liquor to sewers is to be deprecated because, quite apart from the loss of ammonia, there is the risk of the evolution of hydrogen sulphide which may reach a concentration in manholes dangerous to men who may be working in them.

Attempts have been made to reduce the hydrogen sulphide content of crude ammoniacal liquor by aeration prior to discharge into sewers. This procedure would result in sweeping out some of the hydrogen sulphide while much of the remainder would be oxidised. A portion of the free ammonia would also be removed. The chief difficulty seems to have been that of dealing with the foul exit air in order not only to conserve the sulphur in the hydrogen sulphide, but also to comply with the Alkali Works Regulation Act.

The only plant operated for this purpose was installed at Rochdale Road gasworks, Manchester, where complete removal of H_2S from the liquor was claimed.

The arguments above favour liquor concentration because hydrogen sulphide and cyanide and the free ammonia are absent in the effluent produced.

In this way the oxygen absorption, O/A, of the effluent is reduced from 20% to as much as 40% of the original liquor, depending upon the initial composition, but its volume is increased by at least 15%.

The question of electrostatic tar precipitation before condensation is worthy of attention. The research with which Dr. Monkhouse[11] was associated showed that in certain cases still effluent could be improved by installing a precipitator on the hot gas stream in order to reduce or prevent the solution of higher tar acids (H.T.A.), or polyhydric phenols, in the ammoniacal liquor.

Francombe[12] has also pointed out that after hot gas detarring the crude or spent ammoniacal liquor sent to the sewage works for disposal is less objectionable, because of the rela-

tive absence of the higher tar acids. These give rise to highly coloured effluents which are difficult to oxidise in the sewage beds.

The question of treating the crude liquor or effluent in other ways such as dephenolation is referred to later.

(c) *Disposal of Crude Liquor and Still Effluent.*—This subheading divides itself naturally into two parts, depending upon the two main methods of disposal—namely, (a) sewage works, (b) other methods.

Whichever method is adopted, mention should be made at this point of a new type of effluent which may result from the operation of certain processes for the liquid purification of town gas. In the Manchester process, for example, the nature of the effluent depends upon the form in which the sulphur is recovered, and also from a necessity for preventing an undue accumulation of thiosulphate and thiocyanate in the circulating medium.

If the sulphur sludge is dewatered to yield a product containing about 60% sulphur, there will be produced some 200 gal. of liquid per mill. cu.ft. of gas purified, containing considerable amounts of thiosulphate and thiocyanate, and having an O/A value as high as 3,500, although the average may be taken at about 2,000. As mentioned elsewhere in this paper thiocyanate is more difficult to oxidise than thiosulphate and thus presents a greater problem at the sewage works.

Cooper[13] has suggested a method for the treatment of this type of effluent which would, if expectations are realised, reduce the O/A value to about 200, although the volume of liquid may be about doubled by dilution.

Film drying of the sulphur has the advantage of not producing any liquid effluent,[14] the soluble salts being crystallised out and discharged with the sulphur.

Autoclaving, or pressure extraction, of the sulphur sludge does not appear to increase the toxicity of the effluent appreciably, and during this treatment sulphate is produced rather than thiosulphate.

Disposal via Sewage Works

This section deals essentially with such liquor or effluent as is actually passed through sewage treatment plant. It does not follow that because liquor or effluent is accepted into a sewage system it is treated in any biological way. The sewers may merely discharge the untreated sewage into a tidal river or estuary. It may, however, be taken as a general rule that discharge into sewers for treatment with the sewage at the sewage works is the method recommended for effluent disposal, although for various reasons the problem tends to have become complicated since nationalisation, because some local authorities appear to have adopted a less favourable attitude because some have overloaded sewage works, and some have increasing quantities of gas liquor to deal with. It is, therefore, all the more necessary to urge close collaboration between the gas industry and those responsible for sewage treatment and disposal.

In that connection the rate of egress is a very important matter if liquor is admitted to a sewage system, because, although bacterial beds can deal with tar-free ammoniacal liquor in small quantities, they can only do so efficiently so long as its amount is relatively constant with respect to the sewage flow. This point is usually insisted upon by the sewage authorities, and for that purpose so-called 'balancing tanks' have been recommended, and in some cases already installed, at a number of units in the area of the South Western Gas Board. An example is shown in Fig. 2.

Various authorities have stated clearly the minimum requirements for the acceptance of ammoniacal liquor and effluents. They are:—

(a) Liquor must be free from tar.
(b) The temperature of the liquid should not exceed 110°F.
(c) The flow should be under strict control, and its ratio to dry weather sewage flow should remain constant.

Although under this heading both crude liquor and still effluent are being considered, it should be emphasised that all possible steps should be taken to exclude crude ammoniacal liquor from sewage on account of both its objectionable effects in the sewage system and the cost of its treatment at the sewage works.

When considering the disposal of effluents it is neither necessary nor desirable for us to assume the role of sewage experts, but there are certain fundamental points upon which we should be quite clear if satisfactory collaboration with the sewage people is to be attained. These points are concerned with the methods of measuring the amounts of pollution, the effects of pollution, and processes for the treatment of sewage, and they have been dealt with authoritatively by Southgate[15] and Key,[16] while Badger[17] has given some useful information on the methods of measuring the degree of pollution.

In general, when an effluent is discharged into a body of water, more or less of the oxygen dissolved in the water is removed, but there is no really satisfactory method for assessing the degree of pollution resulting from the reduced dissolved oxygen content. There are two tests which are mostly used, and they are described briefly below, together with some notes on their limitations.

Biochemical Oxygen Demand.—The oxidation of organic matter in sewage which takes place under natural conditions is biochemical rather than chemical, being carried out by the aid of lower forms of animal and vegetable life. The test, which endeavours to reproduce natural conditions, has the disadvantage that the results are not known for five days, and also that it is dependent to some extent on the nature of the water used for diluting samples.

Oxygen Absorption (O/A), which is used in an attempt to determine the relative amounts of oxidisable matter present in sewage. The oxidising agent generally used is acidified potassium permanganate and the prescribed conditions in the tests must be adhered to rigorously if comparative results are to be obtained. During the O/A test the organic matter in sewage is far from completely oxidised so that as a measure of the actual amount present the test fails completely. It is inadvisable to rely on this test for determining the strength of sewages containing trade wastes. A test in which oxidation is complete, was recommended by Abbot[18] using potassium dichromate, although being a chemical test it is for that reason open to objections like the permanganate test. In addition dichromate may oxidise substances which are not readily attacked by bacteria, and so give a false impression of the effect of the polluting liquid.

While the B.O.D. test approaches the actual conditions in practice, the value obtained is not necessarily the same as the total amount of oxygen that will eventually be taken up. The O/A test gives results which are comparable with the B.O.D. test but not necessarily the same. As Badger[19] points out, O/A test is the more suitable for strong effluents, but has the objection that the oxidation depends upon the particular substances present; thus the carbonaceous matter and ammoniacal nitrogen in domestic sewage are only partially oxidised. As a result, allowance must be made for the degree of oxidation shown by this test when considering the amount of oxygen likely to be required by biochemical action at the sewage works and, for domestic sewage, the 'McGowan strength' is often used for the purpose.

The O/A is multiplied by 6.5 to allow for the fact that the oxidation of the carbonaceous matter is only 15% complete, and the ammoniacal nitrogen by 4.5, which corresponds to the amount of oxygen necessary to form nitrate from ammonia. In the paper quoted, Badger makes it clear that it would be wrong to apply the McGowan formula to gas liquor, because the degree of oxidation of its constituents in the permanganate test is very much greater than for those in domestic sewage.

The comparatively high degree of oxidation of gas liquor in the permanganate test has been recognised by the Institute of Sewage Purification, and it suggests that the oxygen absorbed in the 4-hour test should be multiplied by 1.4. This corresponds to an assumed efficiency of oxidation of about 70%. The effect of ammonia is not mentioned, but in a

recent agreement for the discharge of spent gas liquor into a sewer the amount of oxygen absorbed due to biochemical oxidation of ammonia at the sewage works is assumed to be 2.25 times the weight of ammoniacal nitrogen and is apparently based on the fact that in the activated sludge process the oxidation of ammonia is not complete.

The amount of oxygen actually absorbed under the conditions of the permanganate test for O/A, compared with the theoretical oxygen requirements for certain constituents of ammoniacal liquor is shown in Table 4, which has been constructed from published data[20], [21]. There does appear, however, to be some doubt concerning the theoretical oxygen requirements in the case of thiocyanate, because Badger (*ibid*) gives the oxidation products as carbon dioxide and ammonium sulphate, while Frankland and Silvester[22] give the following:

$$CNS + 3O = SO_2 + CN$$

A biochemical reaction setting free the toxic cyanide would appear to be very doubtful.

TABLE 4
Oxygen Absorbed by various constituents of liquor

Constituent	Oxidation Reaction	O/A grams/gram of Constit. Theor. Oxygen Requirement	Found by $KMnO_4$ test. 4 hours at 26.7°C.	Found % of Theor.
Sulphide	$H_2S + 2O_2 \rightarrow H_2SO_4$ ↑	1.882	1.345	71.5
Phenol	$C_6H_5.OH + 7O_2 \rightarrow 6CO_2 + 3H_2O$	2.382	1.780	74.8
Cresol	$CH_3.C_6H_4.OH + 17O \rightarrow 7CO_2 + 4H_2O$	2.519	1.540	61.1
Catechol (−O)	$C_6H_4(OH)_2 + 7O_2 \rightarrow 6CO_2 + 3H_2O$	1.891	1.245	65.8
Thiocyanate (as CNS)	$NH_4.CNS + 2H_2O + 2O_2 \rightarrow CO_2 + (NH_4)_2SO_4$*	1.103	0.827	74.9
Thiosulphate (as S_2)	$H_2S_2O_3 + H_2O + 2O_2 \rightarrow 2H_2SO_4$	1.000	0.856	85.6

The O/A in p.p. 100,000 is calculated from the concentrations in grams/100 ccs. of the various constituents.
Sulphide concentration as $H_2S \times 1345$
Phenol concentration as $C_6H_5OH \times 1780$
Thiocyanate concentration as $CNS \times 827$
Thiosulphate concentration as $S \times 856$
* Frankland & Silvester[22] give equation :—$CNS + 3O = SO_2 + CN$

It is also necessary to have a reasonably clear idea of what is meant by the term 'toxic substances.' A given substance when discharged into a body of water may be toxic for one or both of two reasons. A substance may be directly harmful by reason of its properties, and thus exert a lethal action upon fish and other forms of life (examples of such substances are cyanides and phenol) or it may cause trouble, when oxidised by means of bacteria and other forms of life, because of a reduction of the oxygen dissolved in the water.

Such oxidation of toxic substances may cause the amount of dissolved oxygen in the water to fall to such a low level that it is unable to support aquatic life. Surface waters contain many different living organisms, including bacteria, protozoa, microscopic and macroscopic plants, and higher equatic animals. As pointed out by Southgate [24] these organisms form a balanced community and when such flora and fauna are living efficiently under natural healthy conditions they cause the water to be purified continuously. The maintenance of healthy conditions in surface waters depends on the presence of oxygen in solution and, if its concentration falls, the higher organisms are killed or driven away and the character of the lower organisms is changed.

If the oxygen content falls sufficiently, the polluting matter may undergo anærobic decomposition, often with the production of foul-smelling products. One substance evolved under such conditions is hydrogen sulphide which, as is well known, may be responsible for some cases of gasholder pollution.

The solubility of oxygen from the air in water at ordinary temperature is of the order of 1 gramme per 100 litres, although the precise amount depends upon the pressure, temperature, and salinity of the water. The amount dissolved diminishes regularly with increase of salinity, and sea water dissolves only about 70% of the amount of oxygen dissolved by distilled water.

References

1. 11th Report, Chairmen's Tech. Committee. Inst. Gas Eng., Comm. No. 372 (1950), 3, 4 and 6.
2. Badger, E. H. M., A Survey of the Liquor Disposal Problem, Inst. Gas Eng., Comm. No. 360 (1949).
3. Priestley, J. J., The Treatment of Effluent Liquors from Gasworks, Scottish Jun. Gas Assocn. (Western), 1949.
4. *Gas World*, 1950, **132**, 24 ; also Inst. Gas Eng., Comm. No. 370 (1950).
5. Inst. Gas Eng., Comm. No. 372 (1950), 15.
6. Key, A., Gasworks Effluents and Ammonia, 7-13.
7. *Ibid.*, 10.
8. *Ibid.*, 11.
9. *Ibid.*, 11.
10. Trans., Inst. Gas Eng., 1927-28, 522.
11. Monkhouse, A. C., Third Report, Liquor Effluents Research Sub-Committee, Inst. Gas Eng., 1929, 14.
12. Francombe, K. W., Electro-Detarring. Inst. Gas Eng., Pub. No. 386/165. 39.
13. Cooper, C., Private Communication.
14. Priestley, J. J., Liquid Purification. Mid. Jun. Gas Assocn., 1949.
15. Southgate, B. A., The Treatment and Disposal of Industrial Waters. D.S.I.R., 1948.
16. Key, A., The Operation of Gasworks Plant to secure the maximum recovery of ammonia and the production of a strong ammoniacal liquor, 1941.
17. Badger, E. H. M., Inst. Gas Eng., Comm. No. 360.
18. Abbot, Ind. and Eng. Chem., 1927, **19**, 919.
19. Badger, *ibid.*
20. Badger, *ibid.*, 8.
21. Key, A., *ibid.*, 8.
22. Frankland and Silvester, J.S.C.I., 1907, **26**, 234.
23. *Ibid.*
24. Southgate, B. A., *ibid.*, 2.

(*To be continued*)

COAL DISTILLATION AND GASIFICATION.—Concluded from p. 232.

to high steam decomposition, and to absence of losses of potential heat in waste gases. Moreover, this figure takes no account of the surplus power which can be obtained from this system. Thus the expansion of the hot waste gases would generate more power than is required for carbon dioxide removal and for compression of the primary and secondary air, and a further supply could be generated by expansion of the final gas. Making appropriate allowance for this would raise the efficiency to more than 80%.

Production of Hydrogen by the Steam/Iron Process

This process commands attention since, while avoiding the use of oxygen, it dispenses with the removal of carbon dioxide and any question of the conversion of carbon monoxide. As usually operated it is a cyclic process, a bed of iron oxide being first reduced to iron and its lower oxides, usually by blue water gas, hydrogen then being produced by interaction of the iron and lower oxides with steam.

The process is, however, recognised as being both inefficient and expensive. Its inefficiency is mainly due to the alternating reactions being limited by equilibria for which favourable conditions cannot be maintained in the same bed of oxide, while its expense, following on its inefficiency, is the result of the use of a relatively costly reducing agent such as blue water gas.

It is, however, the type of process for which fluidisation appears specially advantageous in allowing the iron oxide to be taken round a circuit so that its reduction and reoxidation can occur in separate vessels each under the most favourable conditions. As reducing agent, one can then use producer gas, and in our case this would be obtained by the gasification of the residue. Various proposals have been made along such lines. Operation could with advantage be under pressure and calculation indicates that a thermal efficiency of 75% should be attainable. Combined with the hydrogenation stage, the overall efficiency of gas production should be more than 80% or, say, 85% if allowance is made for the pressure energy in the gases.

These new processes are still in early stages of development, but by their very nature they appear to offer much better opportunities for achieving higher thermal efficiency than those of existing practice, and 80% does not seem in any way out of reach. The processes have many other features, such as extending the range of coal available to the industry and, we hope, minimising plant charges, but on the ground of thermal efficiency alone we believe that they warrant the fullest examination.

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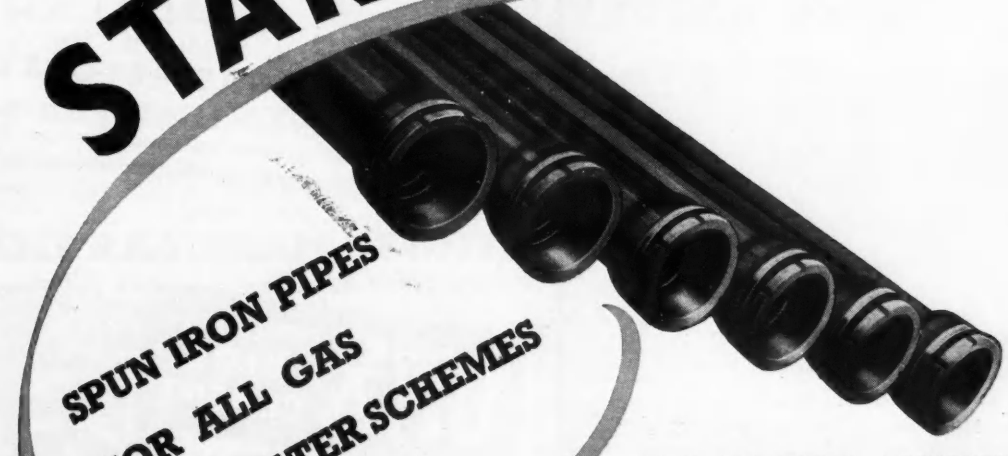

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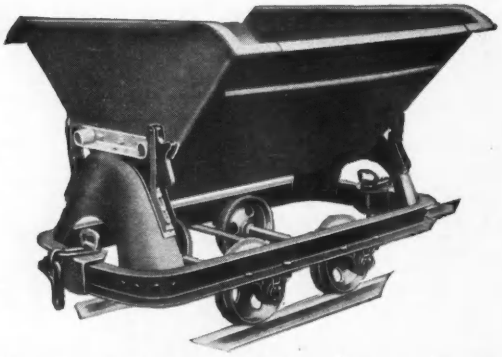

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APPLICATIONS are invited from suitably qualified persons for the above post.

Applicants must have had experience of Showroom supervision and sales and preference will be given to holders of the Institution of Gas Engineers' Certificate in Gas Salesmanship and Consumer Service.

The salary will be within Grade A.P.T. VI of the National Salary Scales (£455-£535 per annum).

The successful applicant may be required to pass a medical examination and to subscribe to such scheme of superannuation as the Board may adopt.

Applications giving personal details, particulars of training, qualifications and experience, together with the names and addresses of two referees, should reach the General Manager, North Western Gas Board (Blackburn Group), Cardwell Place, Blackburn, within fourteen days of the publication of this advertisement.

WALES GAS BOARD

APPOINTMENT OF
ASSISTANT DISTRIBUTION ENGINEER
(MAINS).

THE WALES GAS BOARD is proceeding with the development and construction of major gas grid schemes and invites applications for the appointment of Assistant Distribution Engineer (Mains).

The successful applicant will be directly responsible to the Board's Distribution Engineer and should possess at least the Higher Grade Certificate of the Institution of Gas Engineers in Gas Engineering (Supply), or an equivalent qualification.

The commencing salary will be in accordance with qualifications and experience, and will be in the Salary Grade A.P.T. XII (£695/820 per annum). A higher salary might be considered for applicants with exceptional qualifications and experience.

Applications, stating age and giving full details of training, qualifications and experience, together with the names of two referees, should reach the undersigned not later than fourteen days after the appearance of this advertisement.

C. B. MAWER,
Secretary.

Wales Gas Board,
1/2, Windsor Place,
Cardiff.

EASTERN GAS BOARD

IPSWICH DIVISION.
TECHNICAL ASSISTANT.

A TECHNICAL ASSISTANT is required at the Ipswich Works of this Division.

Applicants should be of good education and training and have obtained at least the Higher Grade certificate (Manufacture) of the Institution of Gas Engineers. Experience on large works operating W-D continuous retorts and C.W.G. plant would be an advantage.

Salary will be in accordance with Grade VII of the A.P.T. Scale (Provincial 'A') starting at £500 per annum.

Applications stating age, qualifications and details of training and experience, together with the names of two referees should be sent to the undersigned not later than July 31, 1951.

W. J. COLLINS GARRARD,
General Manager,
Ipswich Division.

Eastern Gas Board,
Crane Hill Lodge,
London Road,
Ipswich.

NORTHERN GAS BOARD

MIDDLESBROUGH DIVISION.

APPOINTMENT OF
ACCOUNTANCY ASSISTANT.

APPLICATIONS are invited for the above appointment. Salary Grade IX, National Joint Council for Gas Staffs, £570 rising to £670.

Candidates must possess a recognised accountancy qualification, and preference will be given to those having experience in the Gas Industry or in Local Government. A knowledge of mechanical accounting methods will be an advantage.

Forms of application will be provided, which should be returned to the undersigned by August 4, 1951.

JOHN W. PALLISTER,
Divisional General Manager.

Gas Works,
Commercial Street,
Middlesbrough.
July 12, 1951.

NORTHERN GAS BOARD

STOCKTON DIVISION.
TECHNICAL ASSISTANT.

APPLICATIONS are invited for the position of TECHNICAL ASSISTANT at the Stockton Unit.

Candidates should hold an I.G.E. Ordinary Grade Certificate in Gas Engineering (Manufacture), or equal, and have practical experience in the chemical control of Gas Works' Plant.

Major extensions are in progress offering the opportunity of valuable experience to the successful candidate.

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The successful applicant may be required to pass a medical examination and subscribe to such scheme of superannuation as the Board may subsequently adopt.

Applications, stating qualifications and experience, together with the names of two referees, should be addressed to G.W. Perks, Engineer & Manager, Northern Gas Board (Stockton Unit), Thompson Street, Stockton-on-Tees, to arrive not later than Tuesday, August 14, 1951.

F. L. SCAIFE,
Divisional General Manager.

(Classified advertisements continued on Supplement 4)

APPOINTMENTS VACANT (ctd.)

SOUTH EASTERN GAS BOARD

SUSSEX DIVISION.

ASSISTANT WORKS CHEMIST—
GLYNE GAP WORKS HASTINGS.

APPLICATIONS are invited for the above-mentioned position.

Applicants should have obtained the minimum educational standard of Inter B.Sc. or its equivalent. Experience on a Gas Works is an essential qualification, particularly in the technical supervision of Gas Works processes.

The commencing salary will be within Grade V of the National Salary Scales (Provincial 'A') in respect of Administrative, Professional and Technical Staffs (£425-£505 per annum) according to qualifications and experience.

Applications in writing (quoting reference V10/171) giving age, present occupation, experience, qualifications, etc., should reach the undersigned not later than fourteen days after the publication of this notice.

R. J. McCRAE,
Personnel Manager.

Katharine Street,
Croydon.

WEST MIDLANDS GAS BOARD

COVENTRY DISTRICT.

ENGINEERING DRAUGHTSMEN.

APPLICATIONS are invited from suitably qualified persons for the following posts at Coventry, but successful candidates may be required to carry out work respecting any of the Undertakings within the Division:—

(*a*) SENIOR CONSTRUCTIONAL ENGINEERING DRAUGHTSMAN.

Candidates must be experienced in engineering draughtsmanship, in the design and layout of Gasworks Construction and erection of plant and buildings and in the preparation of estimates, specifications and builders' quantities.

The salary for the post will be not less than £620 per annum on commencement, rising by annual increments to a maximum of £720 per annum, in accordance with Grade X of the salary scales of the National Joint Council for Gas Staffs.

(*b*) GAS ENGINEERING DRAUGHTSMAN.

Candidates should be experienced in the design, layout and construction of Gasworks plant and equipment.

The salary for the post will be not less than £540 per annum on commencement, rising by annual increments to a maximum of £620 per annum, in accordance with Grade VIII of the salary scales of the National Joint Council for Gas Staffs.

The appointments will be subject to the provisions of such a Superannuation Scheme as the Board may, in due course, adopt and the successful candidates may be required to pass a medical examination.

Applications giving details of age, qualifications and experience, together with the names of two referees, should be addressed to Mr. A. Allen, Divisional Manager, West Midlands Gas Board, Warwickshire Division, Gas Street, Coventry, to reach him not later than fourteen days after the appearance of this advertisement. Applicants are requested to quote ref. T.P.3 when replying to this advertisement.

F. H. CURETON,
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Salary £900 per annum (Australian) payable monthly.

(2) CONSTRUCTION & MAINTENANCE ENGINEER with a thorough knowledge and experience of Gasworks plant design, layout, maintenance etc., and be competent under the direction of the Works Engineer to prepare layout drawings of developmental Works projects including C.W.G. and take charge of installation and maintenance of plant and labour if required.

Applicants must have been engaged either on the staff of a large and progressive Gas Undertaking or a reputable Gas Engineering firm making, supplying and erecting Gasworks plant and equipment, not necessarily carbonizing plant. Experience in gas manufacture would be an advantage. Age 25-30 years.

Salary £900 per annum (Australian) payable monthly. The present annual output of gas is 1,200 million cu. ft. but rapid developments are anticipated which could double the output within a few years.

The successful applicant for position No. 1 will be required to go to Australia by air and his family (if any) would be provided with Tourist accommodation to Brisbane by sea route.

The applicant appointed for position No. 2 would be provided with Tourist passages by sea for self and family (if any).

Travelling expenses will be paid on the basis that each appointee remains in the Company's service for three years.

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Applications for each position stating age, experience and full information regarding training qualifications and positions held, with *copies* of references and when available to be addressed to the undersigned who will supply further information regarding local conditions on request. Closing date August 20, 1951.

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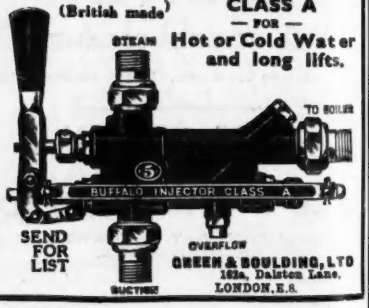

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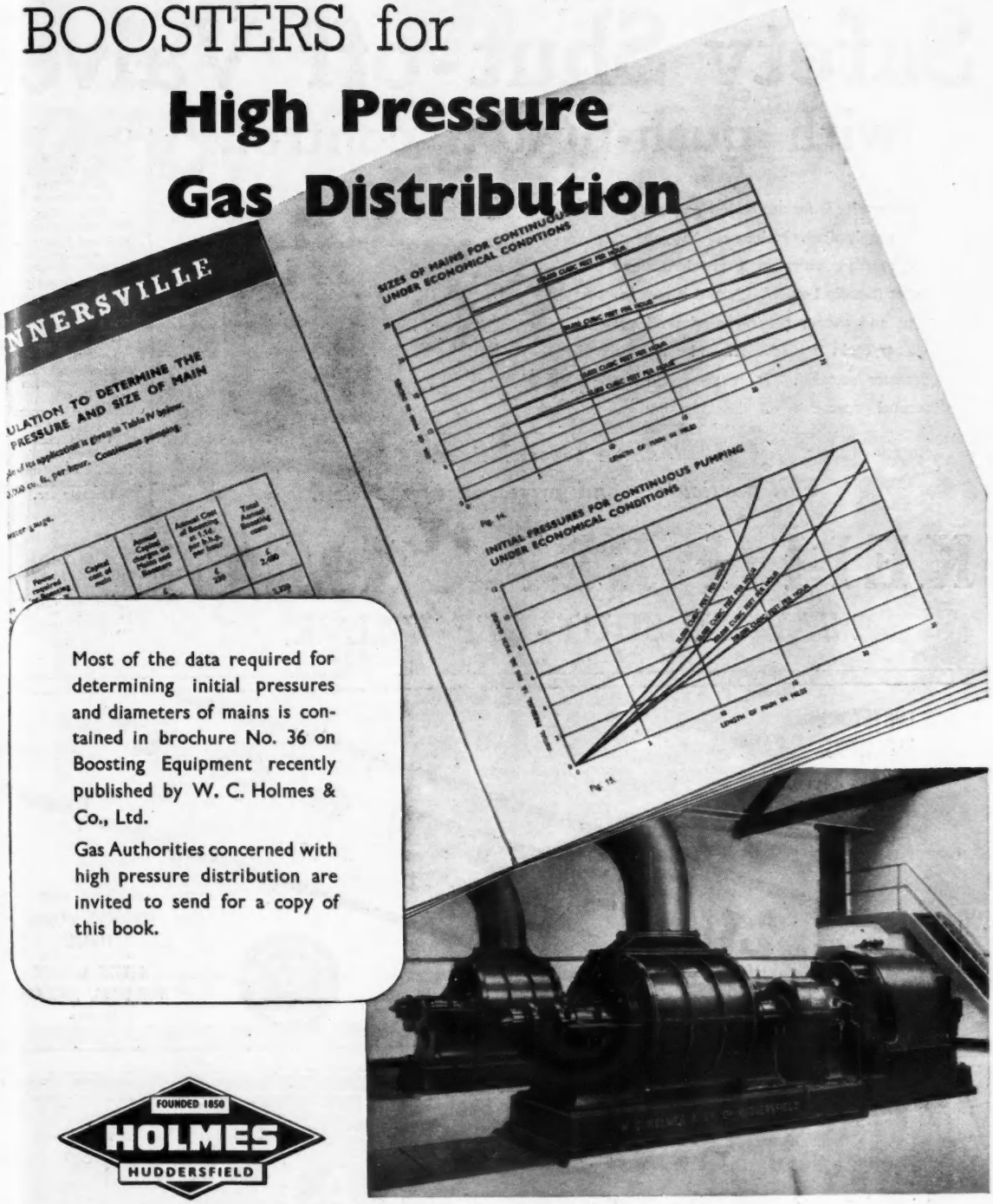
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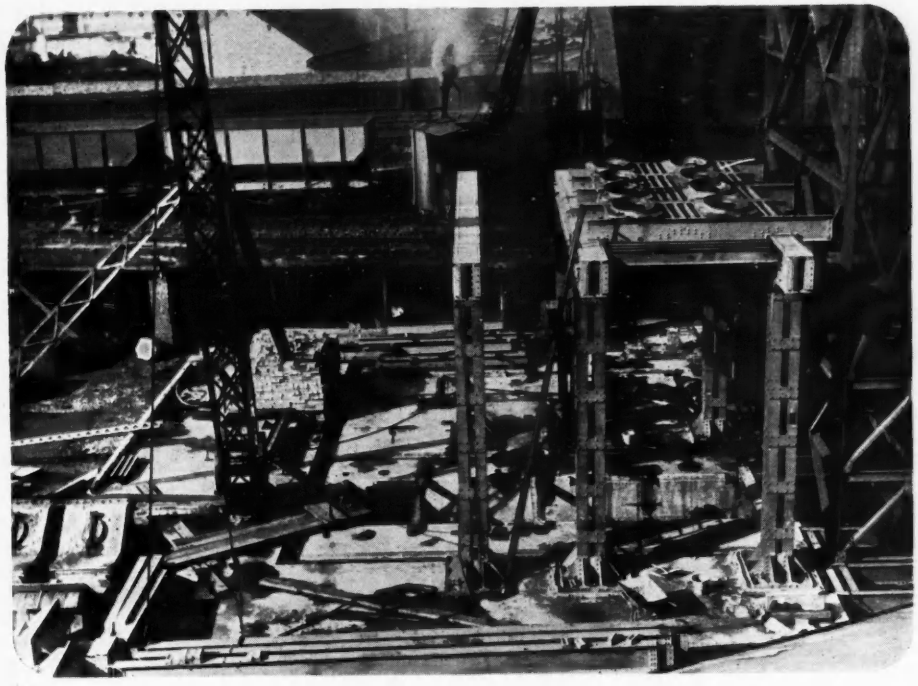

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